ADMINISTRATION OF THE FEDERAL COAL-MINE SAFETY ACT, 1952-59

By James Westfield, H. F. Weaver, and C. M. Keenan

* * * * * * * * * * * * information circular 7974

UNITED STATES DEPARTMENT OF THE INTERIOR
Fred A. Seaton, Secretary

BUREAU OF MINES
Marling J. Ankeny, Director

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PREFACE

This publication covers a report of the Division of Coal-Mine Inspection, Bureau of Mines, for the calendar years 1952-59, as transmitted annually to the Congress by the Secretary of the Interior, pursuant to the requirements of the Federal Coal-Mine Safety Act.

It is believed that this report contains information important enough to be made a permanent record as a Bureau information circular. Previous reports have been published as Information Circulars 7685, 7734, 7765, 7795, 7833, and 7902.

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ADMINISTRATION OF THE FEDERAL COAL-MINE SAFETY ACT, 1952-59[1/]

by

James Westfield,[2/] H. F. Weaver,[3/] and C. M. Keenan[4/]

SUMMARY

A brief résumé follows of activities of the Division of Coal-Mine Inspection that have had a favorable effect on health, safety, and the reduction of injuries at coal mines:

1. The Federal Mine Safety Code for Bituminous Coal and Lignite Mines of the United States was issued originally by the Director of the Bureau of Mines on July 24, 1946, after consulting with management and labor representatives of the coal-mining industry. The code has been used by Federal coal-mine inspectors while inspecting bituminous-coal and lignite mines as a basis for determining the existence of unhealthful and unsafe conditions and practices in these mines. A revised code was issued by the Secretary of the Interior on October 8, 1953, after further consultations with representatives of management and mine workers and was incorporated by reference in the 1952 and subsequent bituminous-coal wage agreements. The agreement of May 29, 1946, between the Secretary of the Interior, acting as Coal Mines Administrator under authority of Executive Order 9728, and the United Mine Workers of America, covering bituminous-coal and lignite mines in Government possession, charged Federal coal-mine inspectors with the responsibility of making periodic investigations of the mines and reporting to the Coal Mines Administrator any violations of the Federal Mine Safety Code. Federal coal-mine inspectors also had temporary authority to close mines found to be imminently dangerous, but such authority under Executive Order 9728 was removed on June 30, 1947, when Government control of the mines was terminated.

2. The Safety Standards for Anthracite Mines were prepared by personnel of the Bureau of Mines and have been used by Federal coal-mine inspectors as a basis for determining unhealthful and unsafe conditions and practices during their inspections of the anthracite mines of Pennsylvania. These standards were revised and issued by the Secretary of the Interior as the Federal Mine Safety Code for Anthracite Mines of the United States on October 14, 1953.

1/ Work on manuscript completed March 1960.
2/ Assistant Director--Health and Safety, Bureau of Mines, Washington, D. C.
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3. Public Law 328 (ch. 450, 80th Cong., 1st sess.), effective for 1 year following its approval (Aug. 4, 1947), required the Secretary of the Interior, acting through the Director of the Bureau of Mines, to submit quarterly reports to the Congress of the United States on the condition of all bituminous-coal and lignite mines inspected by Federal coal-mine inspectors, on all recommendations and notifications sent to State agencies, and on action taken by mine owners, operators, and State agencies on the findings and recommendations.

4. In response to letters from the Secretary of the Interior to the Governors of coal-producing States and personal contacts by field personnel, State-participation plans for joint State-Federal coal-mine inspections (provided for under sec. 202(b), Title II, Federal Coal-Mine Safety Act) have been approved and are in effect in Alaska, North Carolina, North Dakota, Oklahoma, Washington, and Wyoming.

5. Approximately 10,618 coal mines were active in the United States in 1959. Since Public Law 49 became effective in May 1941, 126,369 regular Federal inspections of coal mines have been made, including 11,050 in 1959.

6. The Revised Coal-Mine Accident-Prevention Course for Miners was introduced in the coal-mining industry by the Bureau of Mines on January 1, 1947. Since that date, most mine workers have completed the training, including 3,241 in special on-the-job classes, conducted by Division of Coal-Mine Inspection personnel assigned temporarily to educational work. In addition, thousands of mine workers have been given specialized training in the maintenance, use, and limitations of permissible flame safety lamps to qualify them to test for gas in accordance with the provisions of sec. 209(d)(9) of the Federal Coal-Mine Safety Act; 5,370 mine workers have received this training in the last 7 years.

7. The revised Coal-Mine Accident-Prevention Course for Supervisors was introduced in the coal-mining industry by the Bureau of Mines on March 1, 1948. Many supervisors and those aspiring to official positions have completed this training under personnel of the Division of Coal-Mine Inspection. A new modernized course, Fundamentals of Accident Prevention for Coal-Mine Supervisors is being developed to replace the previous training.

8. A course to train coal-mine electricians, technicians, and others in electrical safety was prepared in 1957; 285 have completed this training.

9. Organizational work to extend the benefits of the Holmes Safety Association is continuing.

10. Federal coal-mine inspectors began investigating all coal-mine fatalities on February 10, 1950. The reports of these investigations are made available to the industry; they are summarized and published annually, with the hope that the information will help to prevent coal-mine accidents.

11. The bolting method of roof control, introduced into the coal-mining industry by the Bureau of Mines in 1948, is a major contribution toward reducing coal-mine accidents. Certain mining engineers and coal-mine inspectors have been especially trained in mine-roof control and roof bolting; they advise

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mine operators whether bolting is practical in their mines and, if so, the proper plan of bolting to follow. More than half of all bituminous-coal underground production in 1959 was mined under bolted roof.

12. To intensify the attack on roof-fall injuries, a program of research and investigation has been instituted by Bureau of Mines engineers to bind mine-roof strata in place to stabilize stratified rock. Efforts of the Bureau of Mines have resulted in the development of moveable crossbar canopies to protect face workmen against roof falls.

13. Personnel of the Division of Coal-Mine Inspection is cooperating fully in the 1960 National Campaign to Prevent Injuries From Roof Falls in Coal Mines.

14. A short Coal-Mine Roof-Control Course, designed to impress mine officials and workmen with the need for more adequate roof-control measures and to make all concerned more roof-control conscious, was initiated by the Bureau of Mines on May 1, 1951. This course has been very popular.

15. A short Coal-Mine-Haulage Safety Course was introduced in the coal-mining industry on April 1, 1951, by the Bureau of Mines, and many haulage employees and other persons have participated in this training under Federal coal-mine inspectors.

16. Other special studies covering roof control, explosives, gases (including restorage of natural gas beneath coal measures), fires, explosions, mining, electricity, haulage, ventilation, rock dusting, and control of atmospheric dusts are being made continually as part of the health and safety program provided for by the Federal Coal-Mine Safety Act. Findings and recommendations are made available to the coal-mining industry.

17. The Bureau of Mines cooperative program has resulted in the recent development of hydraulic fluids for use in mine equipment.

18. As a result of research suggested by the Bureau of Mines, incombustible thermoplastic trailing cables have been developed that have satisfactorily passed the flame and damage tests for fire-resistant cables under Schedule 2F.

19. Standards for minimum fire-fighting equipment for coal mines have been approved and published in the Federal Register.

20. Recommended Standards for the Transportation, Storage, and Use of Oxygen and Acetylene In and Around Coal Mines, Recommended Safety Standards for Coal-Mine Shaft-Hoisting Facilities, and Proposed Standards for Transmission and Distribution of Alternating-Current Electric Power for Face Areas in Coal Mines were approved and issued to Health and Safety personnel during 1959 to serve as guides in making safety inspections. The latter is being processed for publication as an Information Circular. Tentative Recommended Safety Standards for Field-Mixed Ammonium-Nitrate Blasting Agents are in the final stages of development.

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21. Personnel of the Division of Coal-Mine Inspection is active in national, regional, and local safety organizations throughout the coal-mining areas.

22. Coal-mine inspectors and engineers of the division have served on foreign assignments in response to requests from other Federal agencies. These agencies acquire the technical knowledge and wide experience of the Bureau experts, and the assignees have the opportunity of adding to their fund of knowledge and making pertinent information available to the mining industry. One engineer is now serving a 4-year assignment in Afghanistan, and another is in Indonesia.

23. The Division of Coal-Mine Inspection has entered into a cooperative agreement with the Wage and Hour and Public Contracts Divisions of the Department of Labor, whereby the Bureau of Mines field offices inform the regional offices of the Wage and Hour and Public Contracts Divisions of violations of the Federal Mine Safety Code in mines that are under contract to furnish coal to the Federal Government. The operators of such mines face cancellation of Government contracts if the hazards are not eliminated promptly.

24. The overall trend of coal-mine accidents has been favorable since the advent of Federal coal-mine inspection. During the 7-1/2 years under the Federal Coal-Mine Safety Act (through 1959) 12 major disasters, involving 148 fatalities, occurred in the Nation's coal mines; 2 of these killed 21 men in 1959.

Health and safety conditions in coal mines in the United States have improved steadily since the institution of Federal coal-mine inspections. Nevertheless, the frequency of roof-fall fatalities and minor mine fires and gas or dust ignitions indicates that much remains to be done before conditions in many mines can be considered even fairly satisfactory.

The enactment of the Federal Coal-Mine Safety Act, July 16, 1952, affords limited enforcement powers under Title II to Federal coal-mine inspectors with respect to certain safety provisions that might cause or lead to a major disaster in mines that regularly employ 15 or more individuals underground. However, the act prescribes no mandatory provisions, nor is it designed to prevent the day-to-day accidents that result in more than 90 percent of the coal-mine fatalities or to prevent accidents in mines that employ regularly less than 15 men underground (which, as a group, usually have high accident-frequency rates). This large field is left to the cooperative efforts of the Federal Bureau of Mines, State agencies, employers, and employees. The enforcement of rules and regulations concerned with day-to-day accidents, safety, health, and welfare is clearly left within the jurisdiction of the several States.

Doubtless more can be accomplished if the mandatory safety provisions of the act are extended to cover mines that employ regularly less than 15 individuals underground, which, as a group, are poorly regulated.

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INTRODUCTION

This report covers the calendar year 1959 and is submitted to the Congress of the United States in accordance with the provisions of secs. 106(a) and 212(c) of the Federal Coal-Mine Safety Act (66 Stat. 692; 30 U.S.C. secs. 451-483).

Background

The Federal coal-mine inspection program was established to carry out the provisions in Public Law 49, 77th Congress; H. R. 2082, approved May 7, 1941. This act has since been amended to be known as Title I, Advisory Powers Relating to Health and Safety Conditions in Mines, under Public Law 552, 82d Congress, approved July 16, 1952, which also includes Title II, Prevention of Major Disasters in Mines. Public Law 552 is known as the Federal Coal-Mine Safety Act.

Congress passed this act as a result of public indignation and the demands for enforcement powers for Federal coal-mine inspectors following a series of seven appalling major coal-mine disasters that occurred between January 18, 1951, and March 27, 1952.

Under the provisions of Title I, the Secretary of the Interior, acting through the United States Bureau of Mines, is authorized and empowered to make, or cause to be made, annual or necessary inspections and investigations in coal mines, the products of which regularly enter commerce or the operations of which substantially affect commerce. The principal functions of the Federal coal-mine inspectors under Title I are to determine the causes of accidents and occupational diseases in coal mines and then endeavor to eliminate or ameliorate them (1) by revealing, through personal conferences with mine personnel, correspondence, and published reports, the unhealthful and unsafe conditions and practices existing in the mines and (2) by recommending practical means for correcting the conditions observed. Title I does not provide any enforcement powers; therefore, compliance with the recommendations of the inspectors is not mandatory under its provisions. It does give Federal coal-mine inspectors the right to enter coal mines for inspection purposes.

Title I further authorizes and directs the Secretary of the Interior, acting through the Bureau of Mines, to expend the funds made available to him for advancing health and safety in coal mines and for preventing or relieving accidents or occupational diseases therein in such lawful manner as he may deem most effective, in the light of information obtained, to accomplish the objects for which the funds are granted. To comply with this directive, the personnel of the Division of Coal-Mine Inspection is conducting nationwide safety-educational programs for coal-mine officials and coal-mine workmen. In addition, special studies are made of mine health and safety problems relating to roof control, haulage, ventilation, mine disasters, dusts, explosives, gases, and electricity; the results of these studies and any improved methods determined from them are made available to the mining industry and general public through published reports.

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The Federal Mine Safety Code for Bituminous-Coal and Lignite Mines, which is used by Federal coal-mine inspectors as the basis for determining the existence of unsafe or unhealthful conditions and practices in these mines, has been adopted and incorporated by reference in the current National Bituminous-Coal Wage Agreement between the United Mine Workers of America and the bituminous-coal-mine operators. Operators are required under this agreement to comply promptly with recommendations made to correct violations of the code. The agreement also establishes a Joint Board of Review to which either party to the contract may appeal if it feels that the recommendations would cause irreparable damage or great injustice.

The current Anthracite Wage Agreement between the United Mine Workers of America and the anthracite operators accepts the Federal Mine Safety Code for Anthracite Mines, subject to the right of review by the Director of the Federal Bureau of Mines upon petition from either party to the agreement.

Title II of the Federal Coal-Mine Safety Act is designed to prevent major disasters in coal mines the products of which regularly enter interstate or foreign commerce, or the operations of which substantially affect such commerce. Compliance with its safety provisions is mandatory; however, it applies only to coal mines in which 15 or more individuals are employed regularly underground. To accomplish compliance, Title II requires that the Director of the Bureau of Mines shall cause an inspection of each such mine to be made at least annually to determine whether an imminent danger described in sec. 203(a) exists, whether any provision of the Mine-Safety Provisions of sec. 209 is being violated, or whether any mine is gassy as prescribed in sec. 203(d). It further provides that the Director shall make or cause to be made special inspections of such mines as may be required by secs. 203(c) and 206, and any other inspections that he deems necessary for the proper administration of Title II. Provisions also have been made for joint inspections of mines with representatives of the inspection agency of any State that desires to cooperate and submits a suitable plan for participation.

The Advisory Committee

Sec. 108 of Title I provides for appointment of an Advisory Committee composed of not more than six members to exercise consultative functions, when required by the Secretary of the Interior, in connection with the administration of Title I. The members of the committee are:

Thomas Kennedy, President, United Mine Workers of America, Washington, D. C.

W. A. Boyle, Vice President, United Mine Workers of America, Washington, D. C.

Charles Ferguson, Director, Safety Division, United Mine Workers of America, Washington, D. C.

L. C. Campbell, Consulting Engineer, Pittsburgh, Pa.

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Moss Patterson, Vice President, West Kentucky Coal Co., Madisonville, Ky.

J. M. Reid, Vice President, The Hudson Coal Co., Scranton, Pa.

Committee meetings were held in Pittsburgh, Pa., on Dec. 3, 1941; and in Washington, D. C. on Sept. 3, 1941, May 12, 1942, Nov. 5, 1942, Jan. 28, 1946, and Oct. 3, 1950.

EMPLOYMENT OF PERSONNEL

Coal-mine inspectors, electrical inspectors, and engineers of the Division of Coal-Mine Inspection are selected from the Civil Service register, and applicants must meet the rigid requirements of the United States Civil Service Commission before their names can be included in the register.

Following are the basic salaries and the fundamental position requirements for the grades in which coal-mine inspectors are employed:

District Supervisor, GS-14, $11,355-$12,555. This group includes positions with direct responsibility to assign, supervise, and review the work of health and safety engineers, coal-mine inspectors, safety representatives and instructors, and others in the district engaged in programs and special projects of coal-mine inspection and reporting, mine-roof control, industrial health and hygiene, accident-prevention and safety training, and safety promotion in the mineral industries, and all other official functions of the Divisions of Health and Accident Prevention and Coal-Mine Inspection and general supervision of the major administrative districts into which the Nation has been divided.

Subdistrict Supervisor, GS-13, $9,890-$11,090. This group includes positions with the same supervisory and administrative responsibilities as the district supervisors covering the official functions of the Divisions of Health and Accident Prevention and Coal-Mine Inspection in subdistricts of the larger district areas under the supervision and guidance of district supervisors. There are some exceptions to this in that some highly specialized positions not involving management of offices or employees are classified as GS-13.

Coal-Mine Inspector, GS-12, $8,330-$9,530. This group comprises those individual or quasi-supervisory positions relating to coal-mine inspection where the level of the duties and responsibilities exceed those described at GS-11.

Coal-Mine Inspector, GS-11, $7,030-$8,230. This group comprises those who have established their ability to inspect the larger and more complex mines and perform other related health and safety activities with a moderate amount of direct supervision. This might be termed journeyman status.

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Coal-Mine Inspector, GS-9, $5,985-$6,885. This group comprises those, usually probationers, who have had practical experience in the coal-mining industry, but who must be oriented under close supervision so far as inspection techniques, interpretation and application of inspection standards, report writing, and rules, regulations, and policies of the Bureau of Mines are concerned. This might be termed the apprentice grade.

In cooperation with representatives of the Civil Service Commission, the Bureau of Mines late in 1957 completed and approved an assembled examination for Federal coal-mine inspectors to replace the previous nonassembled examination. Announcement No. 152B, issued April 22, 1958, which superseded Announcement No. 326 of 1952, covers this examination.

United States Civil Service Commission Requirements for Federal Coal-Mine Inspectors

Experience

The Federal Coal-Mine Safety Act provides that applicants must have had at least 5 years of practical experience in the mining of coal. In addition, they must demonstrate their knowledge, skill, and ability to perform the duties of the position at the level for which they apply.

Competitors who wish to be considered for the position of Coal-Mine Inspector (Electrical) must show that they have a theoretical and practical knowledge of the fundamentals of electricity and a knowledge of electrical equipment and electrical inspection work as applied to coal mining.

Written Examination

Applicants will be required to pass a written examination, which will test knowledge of the Federal Coal-Mine Safety Act and of the Federal Mine Safety Codes, both bituminous and anthracite. Applicants are urged to study these documents before taking the written examination. The written examination will also test ability to solve arithmetic problems as applied to mine safety, ability to prepare and understand written reports, and a knowledge of the principles of mining and mine safety, including knowledge of first aid as taught in the mining industry.

Ratings Required

Competitors will be rated on the written test on a scale of 100. They must attain a rating of at least 70 on the written test as a whole. They may also be required to attain a rating of 70 in particular subjects.

Certificate

Applicants must show that they possess a Bureau of Mines certificate of competency in first aid and mine rescue before appointment.

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Additional Requirements

Competitors who pass the written test and meet the experience requirements may be given an interview, a performance test of stamina to work in mines, and a driver's road test. These are to determine further whether they possess the personal qualifications, stamina and endurance, and ability to drive an automobile that are essential to proper performance on the job.

The interview, performance test of stamina, and road test will be given to such number of applicants at the top of the register as the needs of the service may require. Those who fail to pass each of these tests will not be eligible for appointment.

Interviews will be required of applicants to determine whether they possess the personal qualities required. Candidates will be rated on the interview on an "in or out" basis. Those rated "out" will receive an ineligible rating.

Confidential Inquiries

Confidential inquiries will be made of persons who are qualified to evaluate the individual applicants for these positions as an additional means of determining whether such applicants possess the personal qualities and the technical abilities sought. References will be asked to evaluate candidates on the characteristics necessary for job success in these positions. Candidates will be rated ineligible where information is received which indicates that the applicant does not possess these necessary characteristics.

Basis of Rating

Competitors will be rated on a scale of 100 in accordance with their knowledge, skills, and abilities in the factors considered important to the proper performance of the duties of a coal-mine inspector. This rating will be determined from an evaluation of their experience and training as outlined in their application forms and upon other information which may be secured by the Board of Examiners. It will be to the applicant's advantage to give a clear and complete description of any pertinent experience or training he may have gained. A Past Performance Record Blank will be furnished for this purpose.

Competitors will be required to attain a passing grade of at least 70 in both the written test and in the evaluation of their experience and training. Their final rating in the examination will be determined by a combination of the ratings attained in the written test and that assigned to their experience and training. The weights given to the examination will be:

Written Test.....75
Experience and Training Evaluation.....25

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Citizenship

Applicants must be citizens of or owe permanent allegiance to the United States.

Age

Applicants must have reached their eighteenth birthday on the date of applying. There is no maximum age limit.

Physical Abilities

Applicants must be physically capable of performing efficiently the arduous duties of this position. They must be free of such defects or diseases as may constitute employment hazard to themselves, or endanger fellow employees or others. Arms and legs must be sufficiently intact and functioning to permit the applicant to perform the duties described above. Vision must be at least 20/50 Snellen in one eye and 20/70 in the other, without glasses. The ability to distinguish basic colors is essential. Hearing, with or without a hearing aid, must be sufficiently acute to enable the applicant to hear ordinary conversation at 20 feet. These standards must be met by all applicants; however, certain requirements may be waived for veterans who can demonstrate ability to perform the duties efficiently and safely.

In view of the strenuous physical exertion required for this position, hernia (whether or not supported by truss), organic heart disease (whether or not compensated), varicose veins (unless slight), serious deformities or disabilities of extremities (including weak feet), mental or nervous disease, chronic respiratory or chronic constitutional disease or other physical defect which would cause the applicant to be a hazard to himself or to others, or which would prevent efficient performance of the duties of the position, will disqualify him for appointment.

Persons who are offered appointment must pay their own expenses in reporting for duty. If upon reporting at the place of assignment they are found to be ineligible because of physical defects, they cannot be appointed and no part of their expenses in returning home can be paid by the Government.

United States Civil Service Commission Basic Requirements for Mining Engineers

Applicants for the position of mining engineer must have completed successfully a full 4-year professional curriculum leading to a bachelor's degree in an accredited college or university or have had 4 years of successful and progressive experience in technical engineering comparable to that acquired by successful completion of a full 4-year engineering curriculum in an accredited college or university. Applicants must be physically able to perform efficiently the arduous duties of the position.

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Probational Appointment

Upon employment, each coal-mine inspector or engineer is given a probational appointment for 1 year. Probationers who do not meet Bureau of Mines standards are separated from the service, in accordance with Civil Service regulations.

TRAINING PERSONNEL

Inspectors and engineers usually are given a 4-week course of intensive training in technical matters and Bureau of Mines policy at the Bureau's Central Experiment Station, Pittsburgh, Pa., before being assigned to field headquarters. When an inspector is employed to replace an individual inspector who has left the service, the new inspector is given on-the-job training first by accompanying experienced inspectors and completes the 4-week training course at Pittsburgh as soon as enough replacements are employed to constitute a class.

The classwork includes lectures, demonstrations, and laboratory work on such vital subjects as roof control, haulage, mine rescue training, first-aid training, causes and prevention of mine fires and explosions, mine gases and methods of detection and control, mine electricity, ventilation, explosives, methods of collecting and analyzing dust and air samples, conducting a coal-mine inspection and preparing inspection and investigation reports, operating automobiles, and general policy.

A new inspector is required to accompany experienced inspectors until he has demonstrated his ability to work alone and is authorized by the Director to conduct inspections without immediate supervision. He is admonished to go slowly with his first inspections--to be very careful and thorough so that hazards are not overlooked. The need for thoroughness is emphasized throughout the training period and is reemphasized from time to time thereafter, so that Bureau policy will not be misunderstood.

One or more coal-mine inspectors of outstanding ability are assigned in certain field offices to assist the field officials in supervising the coal-mine inspectors under their jurisdiction. The supervising inspectors accompany the regular inspectors, instruct them when necessary to improve the quality of their work, and submit reports of their observations for critical review and appropriate action.

Coal-mine inspectors and engineers are called upon from time to time to teach Bureau accident-prevention courses, to address meetings of persons interested in mine safety, and to confer with groups of mining men--all for the purpose of "selling" safety. To assure that the inspectors and engineers are well equipped to perform these duties effectively, most of them have been given a short course of instruction in the conference method of teaching by a nationally known authority on vocational industrial training.

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PROMOTION POLICY

Promotions are effected after a classification review shows that the duties performed by the employee over a significant period of time warrant a higher grade.

It is the established policy that additions to the coal-mine inspection staff shall be made in grade GS-9, and that it is the District Supervisor's responsibility to provide training and supervision for inspectors in grade GS-9, particularly during the probationary or trial period, necessary to develop and train them and prepare them for promotion. The District Supervisor shall give them appropriate tests to determine their proficiency. On full proof of an inspector's ability to assume journeyman status, the District Supervisor shall so certify, summarizing evidence to support his findings. After approval by the Assistant Director--Health and Safety, the personnel office having jurisdiction shall proceed with promotion of the individual to grade GS-11 at the place of employment, if the inspector is already doing or is to be assigned immediately in that area for a considerable time to inspection work classifiable as grade GS-11, subject to limitations inherent in law and regulation. Promotions to grade GS-12 are similarly achieved.

It is Bureau policy that the number of positions in each grade shall be flexible and determined by the demands of the work as it expands or contracts with changes in the industry or in the goals set within the Bureau.

Inasmuch as the work and responsibilities of grade GS-13 positions require exercise of judgment, tact, initiative, and other special qualifications that cannot be measured by a fixed formula, positions in grade GS-13 are filled only on the basis of selection by the joint action of higher ranking officials in accordance with the provisions of the Bureau-Wide Promotion Plan.

Coal-mine inspection positions are to be held only by men who are physically fit to perform rigorous work involved at any time. To insure compliance with this policy it is the duty of each District Supervisor to see that each coal-mine inspector is given a full physical examination at Federal expense at intervals of not more than 5 years, preferably 3 years after age 60, or more frequently if considered necessary. This examination includes full-plate chest X-ray and electrocardiogram and shall be concluded with a statement by the examining physician as to the man's ability to perform the arduous work of a coal-mine inspector. In addition, such personnel is now required to undergo and pass physical examination, paid for by the Government, following each period of illness of 30 days or more. If an inspector is not able to perform such arduous work, the District Supervisor shall move through appropriate channels for disability retirement of the individual or other corrective measures. This procedure shall be applied to all persons whose job title is coal-mine inspector in grades GS-9, GS-11 and GS-12 and all other members of the coal-mine inspection staff, regardless of grade or title, whose positions require that they perform such arduous work.

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ORGANIZATION

The coal-mine inspectors, electrical inspectors, and engineers of the Division of Coal-Mine Inspection are headquartered at strategic places in the coal-producing areas of the United States. A list of the field personnel, by headquarters, as of December 31, 1959, is given in appendix A, table 1; and the numbers of coal-mine inspectors, electrical inspectors, and engineers by headquarters and grades, as of the same date, are given in appendix A, tables 2 and 3.

Reorganization of the health and safety activities of the Bureau of Mines, on the basis of a report of a survey team with members from private industry who were appointed by the Secretary of the Interior, became effective December 19, 1954, in accordance with Administrative Order 695, issued by the Director of the Bureau of Mines on December 8, 1954.

INSPECTION PROCEDURE

The Federal Mine Safety Codes are used as the bases for determining unsafe and unhealthy conditions and practices in all coal mines inspected, and the safety provisions of Title II of the Federal Coal-Mine Safety Act are mandatory at all coal mines that regularly employ 15 or more individuals underground.

Briefly, the standard procedure for inspecting all coal mines (under Titles I and II) follows: Generally, neither the mine operators nor the miners are notified of an impending inspection. The regular inspection work may require 1 day or several weeks, depending on the size of the mine, the thickness and pitch of coal beds, the system of mining, the degree of concentration of working places, the prevalence of hazardous conditions and practices, and other conditions.

The inspector is required (1) to inspect every working place in the mine, all active haulageways, entrances to abandoned workings, accessible old workings, airways, escapeways, other places where men work or travel or where dangerous conditions might exist, electric equipment and installations, haulage facilities, first-aid equipment, ventilation facilities, communication installations, roof and rib conditions, blasting practices, surface plant, etc.

He also is required (2) to test for gas and for oxygen deficiency in all mines and to collect samples of mine air and mine dusts for chemical analysis, if necessary, to determine precisely the conditions with respect to noxious and explosive gases, oxygen content, and coal dust and rock dust.

In multiple-shift operations the inspector is required to devote part of his time to inspection on each shift so that hazards are not overlooked inadvertently and to spend enough time at the active working faces to observe, wherever practicable, a complete cycle of operations, including cutting, drilling, blasting, loading, hauling, support of roof, etc.

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In addition, unannounced spot-check inspections are made between regular inspections of certain mines where experience indicates lack of sincere endeavor by the operator to comply with accepted safety standards between inspections.

To assure that the principle of States' rights is preserved, Title II provides for Joint Federal-State inspections when a State desires to cooperate in such activities. The Director of the Bureau of Mines is required by the act to cooperate with the official mine-inspection or safety agencies of the coal-producing States. Title II provides further that any State desiring to cooperate in joint inspections may submit a State plan for carrying out the purposes of this part of the act. Such a plan shall designate an authorized State safety or inspection agency to administer the plan and give assurance that such agency will employ an adequate and competent staff of inspectors, assign its inspectors to participate in inspections in the State under Title II, and submit reports to the Director of the Bureau of Mines as he requests them. The Director is required to approve any State plan that complies with the provisions of Title II. The Director may withdraw his approval and declare such a plan inoperative if he finds that the State agency is not complying with the spirit and intent of any provisions of the State plan.

If a State plan has not been adopted, the Federal coal-mine inspector is responsible under Title II for taking 1 or 2 courses of action if he finds certain hazardous conditions during an inspection:

1. The first action involves imminent danger: If a Federal inspector finds danger that a mine explosion, mine fire, mine inundation, or man-trip or man-hoist accident will occur in a mine immediately or before the imminence of such danger can be eliminated, he issues a written order requiring the operator of the mine to cause all persons, except certain public officials and those specifically permitted by law to correct the conditions, to be withdrawn from and debarred from the area described in the order. The operator is not permitted to resume normal operations in such an area until:

(a) The conditions specified in the order are corrected to the satisfaction of three duly authorized representatives of the Bureau of Mines appointed by the Director after receiving an application from the operator for annulment or revision of such order, and the order has been annulled or revised by the Director, or

(b) The Federal Coal-Mine Safety Board of Review finds that, after receiving an application from the operator for annulment or revision of the order and after a formal hearing, the condition described in the order was erroneous or no longer exists.

2. The second action involves one or more violations of the Mine Safety Provisions set forth in sec. 209: If a Federal inspector finds that any such mine-safety provision is being violated but that

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the violation does not cause danger that an explosion, fire, inundation, or man-trip or man-hoist accident will occur in such mine immediately or before the imminence of such danger can be eliminated, he is required to issue a written notice to the operator, giving the operator a reasonable time to correct the violation. If, upon making his special inspection to determine whether the violation has been abated in the time originally specified, the Federal inspector finds that the violation has been totally abated, he issues another written notice to that effect. If the inspector finds that the operator should be given additional time to abate the violation, he grants an extension of time in writing.

If, however, the violation is not abated and the Federal inspector finds that circumstances, such as obvious lack of effort by the operator to correct the condition, do not justify granting an extension of time, he issues a written order requiring the operator to cause all persons, except certain public officials and those specifically permitted by law to correct the conditions, to be withdrawn and debarred from the area described in the order. Here again, the operator is prohibited from resuming normal operations in the affected area until the order is annulled or revised by the Director of the Bureau of Mines or by the Federal Coal-Mine Safety Board of Review under the same procedure as described for imminent dangers. Any final order by the Board is subject to judicial review by the United States Circuit Court of Appeals, upon notice of appeal by the Director or the operator.

If a State plan has been adopted, no mine shall be inspected by a representative of the Bureau under Title II unless a State inspector participates in the inspection in accordance with such plan, except where, in the Director's judgment, an imminent danger is deemed to exist and participation by a State inspector would unreasonably delay inspection. If a Federal inspector issues a withdrawal order citing an imminent danger under sec. 203(a) and a State inspector did not participate in the inspection on which the order is based, the mine operator may request the State agency to assign an inspector to inspect the mine.

Title II further provides that no withdrawal order shall be issued if an operator of a mine in a State in which a State plan is in effect fails to abate a violation of a mine-safety provision that does not present an imminent danger under sec. 203(a) at the expiration of the time originally set or extended for abatement unless a State inspector participates in the inspection and concurs in the order. If the State inspector does not concur in the order, the operator or the State or Bureau representative may request the chief judge of the United States District Court for the district in which the mine is located to appoint a qualified, independent inspector to inspect the mine. If, after the inspection, either the independent or the State inspector concurs in the order, it shall be issued.

Withdrawal orders issued to the operator of a mine where a State plan is effective are not subject to review by the Director but are subject to review by the Federal Coal-Mine Safety Board of Review.

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In response to requests, pertinent plans for State participation were drafted and submitted to Alabama, Arkansas, Kansas, Montana, North Carolina, Oklahoma, Washington, and Wyoming to serve as guides in formulating plans for submission to the Director for his approval. On September 29, 1952, a plan submitted by Wyoming was the first to be approved by the Director. Since then, five additional plans have been approved. The States that submitted a plan and the effective date of each plan are: Washington, December 17, 1952; Oklahoma, February 13, 1953; North Dakota, February 16, 1953; North Carolina, March 27, 1953; and Alaska, June 15, 1953. During 1959, 7 joint State-Federal inspections were made in Wyoming, 12 in Washington, 13 in Oklahoma, and 4 in Alaska--a total of 36. (See appendix B, table 2.)

Monthly conferences, in which the Bureau participates jointly with safety directors of the coal-mine operators' and mine workers' organizations headquartered in Washington, D.C., are held to discuss problems in coal-mine safety and consider suggestions and ideas for improving the Federal coal-mine inspection service. Proposed major changes in policy or interpretations of the safety provisions of the Federal Coal-Mine Safety Act and Federal Mine Safety Codes are submitted to this group for consideration and comment. If, after consideration, the Director approves the interpretations of the act, they are published in the Federal Register for the benefit of the industry. This cooperative effort has assisted materially in solving many problems that have been encountered.

Each coal-mine inspector is assigned mines that he inspects regularly. This procedure, adopted in 1948, has resulted in the inspectors showing a greater interest in having the mines under their jurisdiction in the safest possible condition. Every inspector is responsible for devising ways and means of reducing accidents in his area. However, to assure that hazards are not being overlooked, about 1 out of 4 inspections of a mine is assigned to an inspector from another area. To improve the effectiveness of his inspections, he is required:

1. To determine the outstanding causes of accidents at each mine to be inspected; this information is used as a guide to detect hazards during the inspection.

2. To discuss all hazards observed and means of correcting them with the official accompanying him when the hazard is discovered, with the mine-safety committeemen when feasible, and with high company officials when a conference can be arranged.

3. To enlist the cooperation of labor, management, State inspection personnel, and all other safety-promotion agencies.

4. To become acquainted with management, the officials of the mine workers' organization, and the mine-safety committeemen.

5. To attend local union meetings occasionally to discuss safety with the members and endeavor to promote cooperation in accident-prevention work.

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6. To participate in mining institutes, Holmes Safety Association chapter meetings and councils, and other agencies dedicated to the promotion of mine safety.

7. To assume a personal interest in and a definite personal responsibility toward accident prevention.

8. To investigate all fatal coal-mine accidents, gas or dust ignitions, and mine fires in his area.

9. To assist in rescue, recovery, and investigative work after disasters.

10. To aid mine officials in improving operating methods, with a view toward greater efficiency, economy, and safety.

11. To conduct first-aid and mine rescue training and officiate at first-aid and mine rescue contests.

PROCEDURE FOR PREPARING AND DISTRIBUTING COAL-MINE INSPECTION AND INVESTIGATION REPORTS

The coal-mine inspector prepares a preliminary report, in accordance with standard regulations, following a regular inspection of a coal mine that employs less than 15 men underground only if conditions that present imminent danger are observed. Preliminary reports are not prepared for strip mines. Mines that employ less than 15 men underground and strip mines are herein called Title I mines.

The inspector prepares the preliminary report, indicating unsafe conditions and practices observed that present imminent danger, and posts it at the mine within 1 day after he completes the inspection. The Bureau of Mines field offices distribute typed copies of the preliminary report to the mine officials, the State mine-inspection agency, the district and national offices of the mine workers' organization having jurisdiction at the mine, the Washington office of the Bureau of Mines, and the Geological Survey if the mine is on the public domain or Indian land.

Preliminary reports are not prepared after inspections of mines that employ regularly 15 or more individuals underground, herein called Title II mines. In lieu thereof, withdrawal orders, citing imminent dangers under sec. 203(a), or notices, citing violations of sec. 209 (Mine Safety Provisions) involving dangers that do not appear to be imminent, as provided under sec. 203(c), or an order classifying the mine gassy under sec. 203(d) are issued by the inspector to the mine operator during or after completion of an inspection; copies are posted on the mine bulletin board. Field offices of the Bureau of Mines distribute typed copies of such notices or orders to the mine officials and the agencies that receive copies of final reports.

A final report on each inspection, prepared promptly by the inspector, contains a general description of the property and the conditions and practices

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observed during the inspection. Unsafe conditions and practices that are not corrected promptly are recorded in detail, and recommendations are made to correct them. Where applicable, violations of the safety provisions of Title II that were observed during the inspection are cited, and the action taken by the inspector to have the violations abated is indicated. The results of chemical analysis of dust and air samples collected during the inspection are given in the report.

Final reports on inspections of coal mines are prepared and mimeographed in the field offices and distributed to management, the State mine-inspection agency, the national and district offices of the mine workers' organization, the Joint Industry Safety Committee (bituminous-coal mines that are affiliated with the U.M.W.A.), the Washington office of the Federal Bureau of Mines, and the Federal Geological Survey if the mine is on the public domain or Indian land. Reports on mines that supply coal on Government contract are forwarded to the Department of Labor.

Enough reports are reviewed in the Washington office (after they have been transmitted to all concerned) to assure that the rules for preparing and distributing reports are being followed and to obtain information on serious hazards and violations of the safety provisions of the codes and the act.

Posting and distributing the reports and filing the reports in the Bureau of Mines field and departmental offices for public inspection constitute compliance with that part of the act requiring publication and dissemination of findings.

Reports are prepared on investigations of all fatal coal-mine accidents, major and minor coal-mine disasters, and mine fires and ignitions not of disaster proportions. They are distributed by field offices to all agencies and persons that ordinarily would receive copies of the regular inspection reports.

FOLLOWUP PROCEDURE

Under the mandatory provisions of Title II, special inspections are made by an inspector at the expiration of time periods set or extended as reasonable for abatement of violations of sec. 209 and, in instances where men have been withdrawn, upon orders from the Director of the Bureau, in response to a request from the operator, to determine whether the violations have been totally or partly abated.

The inspector may summarily issue an order to the operator to withdraw men from a mine or part of a mine if an imminent danger is deemed to exist or if the operator has not made a reasonable effort to abate a violation of sec. 209 at the expiration of the time that has been set or extended for abatement.

Sec. 205 provides for the creation of a Federal Coal-Mine Safety Board of Review to hear and determine applications filed pursuant to sec. 207 for annulment or revision of orders made pursuant to secs. 203 or 206. In compliance with these provisions, the President, on August 21, 1952, appointed A. U. Miller, C. R. Ferguson, and J. G. Solari to serve as members of the first

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board. Miller was named chairman. In 1953, E. R. Price, manager of coal properties, Inland Steel Co. (retired), was appointed to represent the operators in place of Solari (resigned); and Edward Steidle, dean emeritus, School of Mineral Industries, Pennsylvania State University (retired), replaced Miller as chairman. C. R. Ferguson, Director, Safety Division, U.M.W.A., continues to serve as the representative of the coal-mine workers.

Sec. 206 provides that an operator may apply to the Director for annulment or revision of an order issued under sec. 203. However, where a State-participation plan is in effect, the application for annulment or revision of a withdrawal order must be directed to the Federal Coal-Mine Safety Board of Review.

Sec. 208 provides that any final order issued by the Board under sec. 207 shall be subject to judicial review by the United States Court of Appeals for the circuit in which the mine is located upon appeal by the Director or the operator; it provides further that the decision of a United States Court of Appeals is final and subject only to review by the Supreme Court.

Inasmuch as the Federal coal-mine inspectors have no authority to require compliance with their recommendations under the provisions of Title I, every reasonable and practical effort is made to have these unsafe conditions and practices corrected. One method is to enlist the cooperation of the State mine-inspection agencies that generally have authority to require correction of hazards. When an inspector observes unduly hazardous conditions or practices that are not covered by Title II during inspection of a mine, he informs the local mine officials. If prompt action is not taken to correct the hazards, he so advises the mine-safety committeemen and the Bureau of Mines official in charge; the Bureau official promptly relays the information to the State mine inspector and the head of the State mine-inspection agency. In addition, the statement of the hazard and the recommendation for its correction are capitalized for emphasis in the final report.

Such followup procedures undoubtedly have exerted considerable influence on improving practices and conditions in many mines and reducing coal-mine injury rates.

Twelve of the 832 orders issued since the effective date of the act, requiring withdrawal of men from underground areas, have been appealed to the Federal Coal-Mine Safety Board of Review; 8 of these, issued under State-participation plans, could not be appealed to the Director under the provisions of the act. In each instance where a withdrawal order has been issued and the operator has appealed to the Director of the Bureau of Mines, claiming that the dangerous condition has been corrected, Bureau action was prompt. The Bureau is as much interested as the operator in causing no undue delay in reopening mines after violations of the law are corrected.

During the 90-month period (ended December 31, 1959) that the Federal Coal-Mine Safety Act has been in effect, 15 applications for annulment of gassy-classification orders under sec. 203(d) were made to the Director; 11 applications were denied, and 4 orders were annulled. Six of the Director's

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decisions denying annulment were appealed to the Federal Coal-Mine Safety Board of Review; 3 were upheld by the Board, 2 were reversed, and 1 decision limited the order to the area in which the air sample was collected. Two applications for annulment of gassy-classification orders were made directly to the Board; both were denied. Seven withdrawal orders, issued under State-participation plans in accordance with the provisions of sec. 203(a), 4 citing imminent explosion, 2 citing mine-fire, and 1 citing inundation dangers, were annulled by the Board after it was found that the dangers had been eliminated; the Board granted 3 appeals and denied another appeal regarding orders issued under sec. 203(c), which were appealed directly to the Board; and the Board revised 1 withdrawal order issued under sec. 203(c), for failure to abate violations of sec. 209(d)(9), by extending the time for abatement to permit training enough men in the maintenance, use, and limitations of permissible flame safety lamps to make the required tests for gas. Upon request of the operator the Bureau provided personnel for this specialized training; at its completion, the violation was abated, and the Director annulled the order. Five decisions of the Board were appealed to the United States Court of Appeals--2 by the Director and 3 by operators. The Court affirmed 4 of the Board's decisions; 1 appeal was dismissed because it was not filed within the 30-day limit. (See appendix C.)

REGULAR INSPECTION WORK ACCOMPLISHED

According to a Bureau of Mines survey, 10,618 coal mines were operated more or less regularly in 1959. Tabulations showing the number of coal mines (by types and areas) operated in 1959 are included in appendix D, tables 1 and 2.

Performance data in appendix D reveal that:

1. 11,050 regular inspections of coal mines were made in 1959 (see tables 4 and 5).

2. 126,369 regular inspections of coal mines have been made since 1941, when Public Law 49 became effective (see table 3).

3. 5,705 of the 7,600 active coal mines employing less than 15 men underground (Title I mines) were inspected in 1959, and the average number of inspections per active small underground mine was 0.9 (see tables 4 and 5).5/

4. 1,145 of the 1,208 active coal mines employing 15 men or more underground (Title II mines) were inspected in 1959, and the average number of inspections per larger active underground mine was 2.3 (see tables 4 and 5).6/

5. 1,265 of the 1,810 active strip and auger mines were inspected in 1959, and the average number of inspections per active strip or auger mine was 0.7 (see tables 4 and 5).7/

5/ Owing to intermittent operation or abandonment, it was impossible to inspect some mines that operated part time during 1959.
6/ See footnote 5.
7/ See footnote 5.

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6. The average time required to make a regular inspection and to prepare the inspection report, including travel time, was 1.4 days for strip or auger mines, 1.6 days for Title I underground mines, and 4.6 days for Title II mines, excluding special inspections (see table 6). The average time to complete an inspection of a Title II mine, including special inspections, is 5.0 days (see table 7).

7. 884 special inspections required under Title II were made to determine whether violations cited under sec. 203 had been abated. This averages 0.4 additional man-day for each regular inspection of a Title II mine (see table 7).

During 1959 Federal inspectors observed 110,887 violations of the Federal Mine Safety Codes while inspecting 5,705 Title I underground mines, an average of 19.4 violations per Title I underground mine inspected (see appendix E, tables 1 and 2); only 7 percent of all violations were corrected during the inspections (see appendix F, tables 1 and 2).

Federal inspectors observed 20,501 violations of the Federal Mine Safety Codes while inspecting 1,145 Title II mines, an average of 17.9 violations per Title II mine inspected (see appendix E, tables 1 and 2); 40 percent of the violations were corrected during the inspections (see appendix F, tables 1 and 2).

A total of 7,025 violations of the mandatory mine-safety provisions of Title II of the Federal Coal-Mine Safety Act was observed while 2,750 inspections of these mines were made in 1959, an average of 2.6 violations per inspection; 5,961 (85 percent) of these violations were corrected promptly after detection, and 1,005 original notices (form B) were issued at 387 mines granting reasonable time to abate violations that required more time to correct. Subsequent special inspections revealed that 968 violations had been totally abated, and 177 notices (form C) were issued granting additional time for abatement of others. Fifty-nine withdrawal orders citing imminent dangers under sec. 203(a) (form A) were issued at 45 mines in 1959, making a total of 390 such orders since July 16, 1952 (see appendix B, tables 1, 2, and 3); 36 withdrawal orders under sec. 203(c) (form D) were issued at 20 mines in 1959 for failure to abate violations within a reasonable time, making a total of 442 such orders since July 16, 1952 (see appendix B, tables 1, 2, and 4); and 14 orders (form B-1) were issued classifying mines gassy under sec. 203(d) in 1959, making a total of 136 such orders issued since July 16, 1952 (see appendix B, tables 1 and 2). Comparable inspection data for 1953-59 are given in appendix D, table 8.

No violations of the Federal Mine Safety Codes were observed during inspection of 10 Title I underground mines and 54 Title II mines (see appendix E, tables 1 and 2), and no violations of sec. 209 of the Federal Coal-Mine Safety Act were observed while at least 1 inspection was made of each of 319 Title II mines (see appendix B, tables 1 and 2). Twenty-four mines were free of Title II and code violations during at least 1 inspection.

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The Federal Coal-Mine Safety Act requires the Director to have each mine that is subject to the provisions of Title II inspected at least annually by a duly authorized representative of the Bureau. However, it is believed essential that Title II mines be inspected at least three times a year by the Federal Government, that all small underground mines that are not covered by Title II be inspected at least twice a year, that strip and auger mines be inspected at least once a year, and that spot-check inspections be made between regular inspections at mines where experience indicates lack of compliance with the provisions of the act. These minimum requirements are desirable, because the provisions of Title I of the act are purely recommendatory, and Title II provides no penalties for noncompliance with its mandatory requirements between inspections.

In addition to this mine-inspection schedule, a Federal inspector is required to perform special duties, such as investigating fatal accidents, serious nonfatal roof-fall accidents, and gas or dust ignitions and mine fires; making dust surveys; reviewing reports; working in supervisory capacities; assisting with rescue, recovery, and investigative work after mine disasters; teaching Bureau accident-prevention classes; organizing Holmes Safety Association chapters; and handling various other jobs. Special assignments are essential to comply with the provisions of the Federal Coal-Mine Safety Act and to obtain the greatest benefits from regular inspection work.

Tables 2 and 3, appendix A, show the number of inspectors and engineers employed as of December 31, 1959.

SPECIAL WORK ACCOMPLISHED

Although the routine inspections of coal mines and the distribution of inspection reports are primary functions of personnel of the Division of Coal-Mine Inspection, it is realized that the effectiveness of an inspection is enhanced if mine supervisory personnel and mine workmen have enough technologic and practical knowledge of modern concepts of coal-mine safety to recognize an unsafe condition or practice when it exists or is developing and to know how to correct it. The opportunity to gain such knowledge from the Bureau of Mines was not available generally before 1947, principally because funds were not available for conducting the necessary training.

The need for specialized training is recognized in sec. 106 of the Federal Coal-Mine Safety Act, which authorizes and directs the Secretary of the Interior, acting through the Bureau of Mines, to expend the funds made available to him for advancing health and safety in coal mines and for preventing or relieving accidents and occupational diseases in mines in such lawful manner as he may deem most effective in the light of the information obtained under the act to promote the accomplishment of the object for which the funds were granted.

To comply with this directive, the outstanding special accomplishments of 1959 are related herewith, and miscellaneous special assignments are tabulated in appendix H of this report.

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Coal-Mine Accident-Prevention Course for Miners

The National Bituminous-Coal Wage Agreement provides that:

> At each mine there shall be a Mine-Safety Committee selected by the local union. The Mine-Safety Committee may inspect any mine development or equipment used in producing coal. If the Committee believes conditions found endanger the life and bodies of the mine workers, it shall report its findings and recommendations to management. In those special instances where the Committee believes an immediate danger exists and the Committee recommends that management remove all mine workers from the unsafe area, the operator is required to follow the recommendation of the Committee.

The Anthracite Wage Agreement provides that:

> Mine Committees, acting on the request of individual employees or upon their own personal knowledge, shall have the right to report to management unsafe conditions affecting operations or equipment. In such cases, the Mine Committee shall have the right, accompanied by representatives of management, to make necessary inspections of property or equipment for the ascertainment of actual facts. In the event such conditions, when reported, are not satisfactorily corrected, the Mine Committee shall request action by the State and Federal inspectors.

To assure that members of these committees would be well versed in the provisions of the Federal Mine Safety Codes and thereby be better equipped to recognize unsafe conditions and practices that exist or are developing in mines and to learn the proper means of overcoming them, the Bureau of Mines, in cooperation with the United Mine Workers of America, inaugurated a Coal-Mine Accident-Prevention Course for Mine-Safety Committeemen in January 1947. The course covers the practical and some technical aspects of modern principles of coal-mine safety and requires 20 hours of classroom instruction. Because it was so enthusiastically endorsed by mine-safety committeemen and mine operators, the training course was offered to all mine workmen, and the overall popularity of the training is attested by the record. Most mine-safety committeemen and other mine personnel have completed the course; 3,241 men completed special on-the-job accident-prevention training initiated at a large eastern coal mine in February 1952 (see appendix G for 1959 training). Usually the classes are conducted by Federal coal-mine inspectors who have been especially trained and are authorized to carry on instructional work.

In addition, 5,370 men have received specialized training in the maintenance, use, and limitations of permissible-flame safety lamps in the 7 years ended December 31, 1959, 271 in 1959, to qualify them to test properly for gas in places where electric machines are operated in face areas, in accordance with the provisions of sec. 209(d)(9) of the act (see appendix G for safety-education training).

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Coal-Mine Accident-Prevention Course for Supervisors

The Bureau of Mines Coal-Mine Accident-Prevention Course for Supervisors requires 40 hours of classroom instruction and covers all technologic as well as practical phases of safety as applied to surface facilities; timbering and roof control; transportation, storage, and use of explosives; ventilation and mine gases; coal dust and rock dust; haulage; electricity; safeguarding equipment; fire prevention and control; and miscellaneous items. The course includes lectures, class discussions, demonstrations, and visual aids, such as motion pictures, slides, and blackboard sketches.

This training program has been successful. Since March 1948, when the revised course was first offered, thousands of coal-mine supervisors and others aspiring to similar positions completed the training. A new modernized course, Fundamentals of Accident Prevention for Coal-Mine Supervisors, is being developed to replace this previous training.

Electrical Safety Course

An outline for a course in electrical safety--Electrical Fundamentals and Principles for Coal-Mine Electricians and Supervisors--was prepared by personnel of the Division of Coal-Mine Inspection, and initial training in the industry was begun in 1954. To date, 261 coal-mine personnel have completed the course.

The Holmes Safety Association

Coal-mine-inspection personnel takes an active interest in the Holmes Safety Association, which has been sponsored by the Bureau of Mines since 1926. The association was organized as part of the Bureau's safety-education program to promote health and safety in the mineral industries through cooperative efforts of management and labor and State and Federal agencies. Since 1954 the Bureau has intensified its efforts to expand this organization into mining areas in all parts of the United States, and its efforts are continuing to be successful. This stepped-up program is being conducted by specially trained personnel in the Division of Coal-Mine Inspection in the coal-mining areas.

Experience has proved that injury rates are lower than average in mines that have membership in this association.

Investigation of Fatal Coal-Mine Accidents

The Bureau of Mines has investigated major mine disasters, one in which 5 or more men are killed, since its inception in 1910 as part of its accident-prevention program, and the conclusions drawn from these investigations have been used as bases for recommending measures to prevent recurrences. The Bureau also has investigated explosions and fires in which less than five or no lives were lost, but before 1950 it was not general practice to investigate fatalities resulting from occurrences other than mine fires or explosions. The Bureau has long recognized the need for a comprehensive study of fatal

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accidents, but the task was too great for the available personnel. The reduced frequency of fatalities in coal mines and the increased inspection personnel provided by Congress in recent years permitted achievement of this goal, and all fatal accidents have been investigated since February 10, 1950. A report of each investigation is prepared by the Federal inspector and distributed to instructors of accident-prevention courses and agencies and persons who ordinarily would receive copies of the regular coal-mine inspection reports. The report gives the facts about the accident, the inspector's conclusions on the cause, and recommendations for preventing similar occurrences.

Condensed reports on the investigations of coal-mine fatalities since 1950 have been published annually. The information is particularly useful to officials of coal companies and mine workers' organizations in planning accident-prevention programs; to safety directors, inspectors, instructors, and supervisors who need such information to carry out their duties more effectively; and to mine workers who must know the causes of accidents to be better able to prevent injury to themselves and their fellow workmen. The ultimate objective is to provide information that will be helpful in preventing accidents.

The Bureau of Mines is the only agency that assembles, on a nationwide basis, detailed reports on the investigations of all coal-mine fatalities in the United States.

Roof-Control Work

Accident statistics have indicated for years that falls of roof and coal cause over half the fatalities that occur in coal mines; this fact has challenged everyone interested in improving accident rates in the coal-mining industry. The Bureau of Mines has done considerable research on mine-roof control when funds were available, but until 1948 no person or agency had produced any new or improved means of satisfactorily solving the problems presented by this No. 1 killer in coal mines. The Bureau realized that, to reduce coal-mine injuries, it would be necessary to find better methods of roof control; its efforts in that direction finally culminated in a new method of roof control known as roof bolting, which was introduced in the coal-mining industry in 1948. The basic principle of this method is to prevent the initial sag in exposed roof strata by converting the strata into a rigid beam, with steel bolts set in holes drilled in the roof rock. The bolts must be installed as soon as the roof is exposed by the normal mining process.

After experimentation to prove the practicability and safety of bolting under controlled conditions, the method was widely publicized in Bureau of Mines publications and in the trade journals. To satisfy the demand of mine operators for Bureau suggestions on roof-bolt installations and to assure methods that would not be condemned as failures because of improper installations, the Bureau trained certain Federal coal-mine inspectors and engineers to qualify as expert consultants on roof bolting. These men are headquartered in coal-mining areas where their consulting services are needed, and the mine operators generally obtain their advice and recommendations before purchasing bolts. Some States require mine operators to obtain a permit from the State

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inspection agency before roof bolting can be done. Such wise precautions have contributed much to the success of this new method of roof control.

Before roof bolting is adopted in any mine, the Bureau of Mines recommends controlled experiments--in conformance with the procedures that have been worked out by the Bureau of Mines--to determine whether roof bolting is applicable. (Auxiliary conventional supports are used to control the roof during initial experimentation.) After a safe, economical method of bolting is determined, no deviation from that method is supposed to be made without a new experimental period. If roof conditions change radically from those during the initial experimental period, a new experimental period should be scheduled.

Federal coal-mine inspectors observe roof-bolting procedures during their regular inspections of coal mines and report deviations from the established plans and other substandard practices of roof support.

Roof bolts are used exclusively in many large mines for roof control, and in 1959 more than half the bituminous-coal underground production was mined under bolted roof.

The introduction of roof bolting in the coal-mining industry marks another major contribution of the Bureau of Mines in its efforts to attain the primary objective of the Congress in establishing the Bureau in 1910--to prevent accidents in the mineral industries.

To reduce further the incidence of roof-fall accidents, the Bureau of Mines initiated a Coal-Mine Roof-Control Course in May 1951. It requires 30 minutes to 1 hour of lecture and discussion and is presented to coal-mine officials and employees by a Federal coal-mine inspector, usually after he completes inspecting a mine. The course is designed to impress mine personnel with the need for more adequate roof-control measures and to make everyone concerned more roof-conscious; 65,918 participated in this training in 1959 (see appendix G).

Systematic timbering, use of roof bolts, and training of miners to be alert constantly to roof conditions have been effective in reducing fatalities; however, roof falls still cause over half of all coal-mine fatalities, most of which occur within 12 feet of the working faces where the stability of the newly exposed roof cannot be determined immediately. To guard against these unforeseen dangers, efforts of the Bureau of Mines have resulted in the development of movable crossbar canopies to lessen the severity of roof falls in the immediate, unprotected face areas. Several types are being tested underground.

The search for more effective roof support is continuing; the major efforts of two Bureau engineers have been concentrated on the possibility of strengthening and consolidating roof strata by injecting chemical bonding material into the bedding planes of the strata. Equipment was developed and tests were conducted successfully in three commercial mines--2 in the Pittsburgh and 1 in the Upper Freeport coal beds--to determine the permeability of

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the strata by injecting oil into the bedding planes. After these tests were completed, samples of adhesive materials were obtained from various manufacturers, and laboratory tests were made to evaluate the cohesive, adhesive, and setting-time characteristics of the materials. Equipment was developed to pump the most promising resins into the roof to bond the strata. Considerable experimentation has been done, and results are being observed.

The Division of Coal-Mine Inspection actively cooperates in special safety campaigns, such as the National Campaign to Reduce Roof-Fall Injuries in Coal Mines. Intensive surveys are being made of conventional timbering systems to achieve immediate improvement in roof control and compliance with approved methods and to establish suitable minimum timbering standards where none have been adopted.

Haulage Safety Course

In April 1951 a Coal-Mine-Haulage Safety Course was completed and introduced into the industry. It consists of lectures and illustrations on haulage safety and is presented to mine personnel by the Federal coal-mine inspectors, usually after completing an inspection. During 1959, 11,912 haulage employees, officials, safety committeemen, and others attended this course (see appendix G). Considering the comparatively few men employed in haulage operations at coal mines, the number of trainees is outstanding.

Injury and Employment Data

One of the special duties of coal-mine inspectors and engineers of the Division of Coal-Mine Inspection is to enlist the cooperation of coal-mine operators in submitting injury and employment statistics to the Bureau of Mines in compliance with sec. 105 of the Federal Coal-Mine Safety Act. If an operator needs instruction on how to complete the proper forms, inspectors or engineers are prepared to give advice. Through this service, performed when the mine is being inspected, more and better reports have been submitted to the Bureau by mine operators.

Ventilation Surveys

Certain mining engineers of the division of Coal-Mine Inspection are assigned to coal-mine ventilation studies, surveys, and research. Difficult ventilation problems are encountered from time to time on which mine operators request Bureau assistance. Many of the studies required pressure surveys and technical calculations that the regular coal-mine inspectors seldom are equipped to make (see appendix D, table 3).

Owing to the frequency of minor gas ignitions at faces where boring-type continuous-mining machines are operated, a study is continuing with the cooperation of the Joint Industry Safety Committee to determine the efficiency of auxiliary ventilation in certain mines using these machines in Pennsylvania and West Virginia. The size of such machines seriously hampers normal face ventilation, but studies showed that properly installed auxiliary fans can overcome this difficulty. As a result, manufacturers are exploring the

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possibility of installing small blower fans, preferably hydraulically operated, on continuous-mining machines.

Explosives Surveys

Mining-explosives engineers of the Division conduct special investigations on storage, transportation, and use of explosives and blasting devices. Generally, the studies have been requested by mine operators who are interested in improving the safety and economy of their operations.

The Bureau of Mines has advocated the exclusive use of permissible explosives or permissible blasting devices in coal mines for many years and has advised against the use of black blasting powder and dynamite, which have caused so many gas and dust explosions with heavy casualties. Mining-explosives engineers have done considerable educational work, demonstrating to mine operators by performance tests in the mines that permissible explosives are much safer than black blasting powder and just as economical. Through their efforts and those of the regular coal-mine inspectors, dangerous black blasting powder has been disappearing rapidly from coal mines. The mandatory provisions of Title II ban the storage, use, and handling of black blasting powder in Title II mines, and the mining-explosives engineers have been of great assistance to coal-mine operators in making the required changeover to safer methods of breaking down the coal efficiently (see appendix D, table 3).

Electrical Surveys

Mining-electrical engineers and electrical inspectors of the Division of Coal-Mine Inspection conduct special technical investigations of electrical facilities and installations in coal mines, generally at the request of mine operators (see appendix D, table 3). These engineers also are assigned to cooperate with industry in conducting research work on electrical apparatus with a view toward designing safer equipment. The electrical inspectors advise and assist the coal-mine inspectors in determining the status of permissible electrical face equipment as required by sec. 209(f)(1) of the Federal Coal Mine Safety Act.

Research has developed improved protective devices to replace the frame-grounding conductors in trailing cables of mobile electrical equipment. The reduction of insulating materials in and increased rigidity of trailing cables necessitated by incorporating an additional conductor have caused many trailing-cable failures--some with disastrous results. Manufacturers of such equipment have cooperated, and several devices have been certified by the Bureau as acceptable.

Because of recent gas ignitions caused by electrical face equipment, the Director of the Bureau of Mines has initiated a program of intensive research to develop a practical, reliable, and safe device to be installed as an integral unit on each permissible machine that will:

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1. Automatically cut off electric power from a face area and each machine operating therein whenever the concentration of methane in the affected area reaches a predetermined value.

2. Automatically cut off electric power from a permissible machine and its trailing cable whenever a short circuit develops in the machine or trailing cable.

As an additional safeguard against ignitions, research is planned to determine the practicability of introducing a flow of inert gas into vital compartments of face electric equipment where explosions of gas could originate while the machines are being operated.

Dust Surveys

A course in instruction in the Determination and Control of Unhygienic Dusts has been given by personnel of the Bureau's Branch of Health Research to certain employees of the Division of Coal-Mine Inspection. The objective is to provide each main field station with a man qualified to determine the concentration of airborne dusts in coal mines and to cooperate in such surveys with dust experts of the Branch of Health Research.

To determine more accurately the adequacy of the rock dusting to prevent dust explosions, an intensive patterned dust-sampling survey is made of at least one section during each inspection of a coal mine. In addition, special rock-dusting surveys are conducted as required.

Research to Minimize Hydraulic-Fluid Fire Hazards

Late in 1955 a study was initiated to determine what test procedures the Bureau should follow to develop economical, nonflammable hydraulic fluids for use in mine equipment. A cooperative program, with mine operators and manufacturers of mining equipment and hydraulic fluids and their components participating toward this end, has resulted in the recent development of economical nonflammable hydraulic fluids for mine equipment. The flammable fluids used in hydraulically controlled equipment in mines present serious hazards when fires occur in or near such equipment. Bursting hydraulic systems have caused many mine fires to spread out of control. Use of nonflammable fluid will materially decrease these occurrences.

Fire-Resistant Trailing Cables

As a result of research suggested by the Bureau of Mines, incombustible thermoplastic trailing cables have been developed that have satisfactorily passed the flame and damage tests for fire-resistant cables under Schedule 2F, Regulations Governing Permissibility Tests for Electric Face Equipment.

Safety Standards

Recommended Standards for the Transportation, Storage, and Use of Oxygen and Acetylene In and Around Coal Mines, Recommended Safety Standards for

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Coal-Mine Shaft-Hoisting Facilities, and Proposed Standards for Transmissions and Distribution of Alternating-Current Electric Power for Face Areas in Coal Mines were approved and issued to Health and Safety personnel during 1959 to serve as guides in making safety inspections. The latter is being processed for publication as an Information Circular. Tentative Recommended Safety Standards for Field-Mixed Ammonium Nitrate Blasting Agents is in the final stages of development.

Study of Natural-Gas Restorage Areas in Coalfields

Because the restorage of natural gas (some at pressures above the initial rock pressures) in the exhausted sands under active coal-mining areas and the installation of high-pressure gas-transmission lines overlying active coal-mining areas present potential gas-explosion hazards in the adjacent coal-bearing strata, considerable work has been done to chart and correlate the gas-restorage fields and the gas-transmission lines with the active coal-mining areas. Division personnel and coal-mine operators have appeared before legislative committees to assist in formulating legislation to protect coal-mine workmen and mining properties.

Participation in Safety Organizations

Personnel of the Division of Coal-Mine Inspection serve as officers and committee members and participate in the various programs of the National Safety Council and its affiliated regional organizations and in the Mine Inspectors' Institute of America, the National Mine Rescue Association, the American Mining Congress, and other national, regional, and local safety organizations throughout the United States.

The chief of the division serves as secretary of the Coal-Mining Section, National Safety Council, and is editor of the section's monthly newsletter.

Cooperation With Other Federal Agencies

Personnel of the Division of Coal-Mine Inspection have accepted special assignments from other Federal agencies to Colombia, Austria, Korea, Venezuela, Turkey, Germany, Burma, Afghanistan, Indonesia, and India. One engineer is presently serving a 4-year assignment in Afghanistan, and another is in Indonesia.

Special assignments of engineers and inspectors serve a twofold purpose: (1) The agency to which the Bureau expert is loaned receives the benefit of his wide experience in mining, and the expert, in turn, adds to his fund of knowledge; and (2) the information obtained through this special work is made available to the mining industry if it is deemed in the public interest.

Personnel of the Division of Coal-Mine Inspection cooperates with the Wage and Hour and Public Contracts Divisions, United States Department of Labor, in administering the Public Contracts section of the Walsh-Healey Act. The Bureau of Mines field office informs the regional office of the Wage and Hour and Public Contracts Divisions when violations of the Federal Mine Safety

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Code are found by Federal coal-mine inspectors at mines that are under contract to furnish coal to the Federal Government. The Department of Labor requires the mine operator to eliminate the dangers or face cancellation of the contract.

Under Order 1940, April 4, 1944, the Secretary of the Interior delegated to the Bureau of Mines the responsibility for all mine-safety inspections of mining operations on public domain, Indian lands, and other Government-lease mining operations. In addition to the usual inspection procedures, the Bureau makes these investigations in conformance with the applicable parts of the regulations of the Federal Geological Survey, the Office of Indian Affairs, and the General Land Office; copies of the reports are sent to the Geological Survey.

Revision of State Coal-Mining Laws

Since 1947 the Division of Coal-Mine Inspection has helped to prepare proposed revisions of the coal-mining laws of 14 States.

The safety-regulations sections of the proposed revisions were designed along the lines of the Federal Mine Safety Codes, assuring more modern and standardized State coal-mining laws. They have been adopted, substantially as written, in Alabama, Colorado, Indiana, Maryland, Montana, Tennessee, West Virginia, and Wyoming.

The Bureau of Mines will continue to furnish this service to any agencies directly concerned with improving State mining laws, such as labor organizations, coal-operators' associations, and State officials.

This contribution toward the reduction of injuries in coal mines is another major and vitally important step taken by the Bureau to fulfill its obligations to the coal-mining industry.

First-Aid and Mine Rescue Training

Personnel of the division conducted first-aid and mine rescue training for coal-mine personnel in 1959; 10,348 persons completed the course in first aid, and 449 persons completed the mine rescue training (see appendix G).

Miscellaneous Special Assignments

Appendix H gives a breakdown of miscellaneous special assignments completed in 1959.

ACHIEVEMENTS

This report covers the 7th full calendar year of coal-mine inspections under the Federal Coal-Mine Safety Act and the 18th full calendar year since Federal coal-mine inspections were begun. The effectiveness of the work done by all concerned in fulfilling the principal purpose of Federal inspections--the reduction of accidents in coal mines--is revealed in part by comparing the

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injury records for equal 10-year periods before and after 1941, when the law became effective. Injury records also are given for the calendar years 1952-59 to build up a new 10-year period.

For the 10 years before Federal inspection of coal mines, the fatality frequency rate was 1.61 per million man-hours of exposure in Pennsylvania anthracite mines, and the nonfatal frequency rate was 105.94; for the next 10 years, under Federal inspections, the fatality rate was 1.12 and the nonfatal-injury rate 80.19. For the 8-year period, 1952-59, the fatality rate for anthracite mines was 1.12 and the nonfatal-injury rate 63.58.

For the 10 years before Federal inspection of coal mines, the fatality frequency rate in bituminous-coal mines was 1.48, and the nonfatal-injury frequency rate was 65.81; for the next 10 years, under Federal inspections, the fatality rate was 1.19 and the nonfatal-injury rate 55.58. For the 8-year period, 1952-59, the fatality rate dropped to 0.99 and the nonfatal-injury rate to 44.26. (See appendix I, table 1.)

Fatalities and nonfatal injuries, by calendar years, that have occurred in coal mines of the United States since 1932 are shown in appendix I, table 2. Preliminary figures indicate that the number of fatalities decreased from 356 in 1958 to 290 in 1959, and nonfatal injuries decreased from 14,354 to 13,090. The fatal-accident frequency rate decreased from 1.13 in 1958 to 0.99 in 1959, and the nonfatal-injury frequency rate decreased from 45.68 in 1958 to 44.66 in 1959.

The number of major coal-mine disasters in the United States and the resulting fatalities are listed for each year since 1931 in appendix I, table 3. (A major disaster is any accident that causes the death of 5 or more persons.) Twelve major coal-mine disasters, involving 148 deaths, occurred in the 7-1/2 years between the effective date of the Federal Coal-Mine Safety Act and December 31, 1959. In 1959, 2 major disasters killed 21 men. In January 1959, 12 men were entombed in an anthracite mine when a flood-swollen river broke into the underground workings; and 9 men, all who were underground, were killed by a gas explosion in a Tennessee mine in March 1959.

The longest period between major explosion disasters in coal mines of the United States was 29 months and 19 days--from July 30, 1948, to January 18, 1951. The longest period between major disasters (all kinds) in coal mines of the United States was 26 months and 14 days--from November 4, 1948, to January 18, 1951. The next longest period between major disasters (all kinds) in coal mines of the United States was 26 months and 5 days--from November 13, 1954, to January 18, 1957.

Appendix I, table 4, compares underground fatality frequency in Title I and Title II mines from 1953 through 1959.

The favorable results attained during the past 18 years are not attributable to the efforts of any one group or agency, but it is well known in mining circles that Federal coal-mine inspection activities have been, and continue to be, a potent influence in getting deserved attention to health and safety

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in coal mines. The Bureau has strived, with success, to have management and labor work hand-in-hand to iron out their safety and health problems. The cooperative efforts of management, labor, State inspection agencies, manufacturers of mining equipment, coal-operators' associations, the Federal Bureau of Mines, and other agencies interested in mine safety have brought about improvements in conditions and practices that have resulted in continuing reduction in coal-mine injuries.

NEED FOR LEGISLATIVE ACTION

Expanded Coverage for the Federal Coal-Mine Safety Act

It is recommended that the Federal Coal-Mine Safety Act be amended to cover all underground coal mines.

Many hazards that could lead to disasters are being eliminated in the mines that are within the scope of the mandatory provisions of the Federal Coal-Mine Safety Act, but much more could be accomplished if the enforcement powers of the Federal inspectors were expanded to cover the smaller mines (those employing less than 15 men underground) which, as a group, are poorly regulated.

PUBLICATIONS

The following Bureau of Mines publications, issued during 1959, were prepared wholly or partly by personnel of the division:

Publication	Title	Authors
HSS 470	Fatalities at Pennsylvania Anthracite Mines, 1958	James A. Moore
HSS 474	Falls of Roof, Rib, and Face, The No. 1 Killer in Bituminous-Coal Mines--1958	R. D. Joseph
I. C. 7900	Historical Summary of Coal-Mine Explosions in the United States	H. B. Humphrey
I. C. 7901	Determining the Explosibility of Mine Atmospheres	R. W. Stahl M. G. Zabetakis H. A. Watson
I. C. 7902	Administration of The Federal Coal-Mine Safety Act, 1952-58	James Westfield H. F. Weaver C. M. Keenan
I. C. 7931	Fire-Fighting Facilities at Coal Mines Compared to Industrial Plants	R. W. Stahl
I. C. 7943	Loss of Life Among Wearers of Oxygen Breathing Apparatus (Revision of I. C. 7279)	A. E. Morrow

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APPENDIX A

TABLE 1. - Personnel of Division of Coal-Mine Inspection as of Dec. 31, 1959, and coal area covered by each field office

Health and Safety District A

William Rachunis, District Supervisor,
Wilkes-Barre, Pa.

Coal area covered--Pennsylvania anthracite region

Nicholas M. Benson	Coal-mine inspector	Wilkes-Barre, Pa.
George W. Culverhouse	do.	Do.
William T. Cummings	do.	Do.
Gerald W. Fortney	do.	Do.
David M. Hart	do.	Do.
Charles E. Jones	do.	Do.
Joseph R. Lindsey	do.	Do.
James A. Merrick	do.	Do.
James A. Moore	do.	Do.
Frank A. Retsel	do.	Do.
Clair S. Sigworth	do.	Do.
Arthur A. Sinicrope	do.	Do.
Joseph E. Stanton	do.	Do.
William T. Torrance	do.	Do.
Pauline Bankovich	Clerical	Do.
Ruth A. Ginley	do.	Do.
Martha A. Karweta	do.	Do.
Benjamin J. Levandoski	do.	Do.
Lillian T. Levandoski	do.	Do.
Betty M. Schappert	do.	Do.
Josephine S. Serino	do.	Do.
Lee B. Carson	Coal-mine inspector	Schuylkill Haven, Pa.
John A. Fulmer	do.	Do.
Harvey P. Landis	do.	Do.
Roy E. Seiger	do.	Do.
Robert C. Todd	do.	Do.
Harrison F. Wilson	do.	Do.
Margaret M. Russian	Clerical	Do.
Theodore F. Deak	Coal-mine inspector	Shamokin, Pa.

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Health and Safety District B

W. Dan Walker, Jr., District Supervisor,
Pittsburgh, Pa.

Alexander E. Morrow, Assistant to District Supervisor

Coal area covered--Pittsburgh office--Pennsylvania (Allegheny, Armstrong, Beaver, Butler, Clarion, Fayette, Greene, Lawrence, Mercer, Venango, Washington, and Westmoreland Counties).

James A. Bennett	Coal-mine inspector	Pittsburgh, Pa.
Clyde L. Brown	Mining engineer (electrical)	Do.
Gordon W. Chastain	Coal-mine inspector (RC)1/	Do.
Robert T. Davis	Coal-mine inspector	Do.
Edward C. Dydo	do.	Do.
Frank Heffers	do.	Do.
John W. Holcomb	do.	Do.
Donald W. Huntley	do.	Do.
Ralph I. Krek	Coal-mine inspector (electrical)	Do.
Thomas McDonald	Coal-mine inspector	Do.
Ivan W. Mansell	do.	Do.
William M. Merritts	Health and safety engineer	Do.
Samuel P. Polack	do.	Do.
R. Ward Stahl	do.	Do.
Everett Truner	Coal-mine inspector	Do.
Joseph B. Yanity	do.	Do.
Gerald D. Young	do.	Do.
David T. Parry	do.	Butler, Pa.
Earle M. Rudolph	do.	Connellsville, Pa.
Stacy L. Stiles	do.	Greensburg, Pa.
John Risko	do.	Grove City, Pa.
Lawrence S. Johnston	do.	Kittanning, Pa.
Milton J. Satterfield	do.	Do.
William L. Lyons	do.	Uniontown, Pa.
John A. Noon	do.	Do.
Griffin L. Lynch	do.	Washington, Pa.
Wymar G. Cooper	Coal-mine inspector (RC)	Waynesburg, Pa.
Robert J. Kirk	Coal-mine inspector	Do.
Michael A. Yuhase	do.	Do.
Henry P. Barthe	Physical Science Aid	Pittsburgh, Pa.
Frances A. Begg	Clerical	Do.
Angela B. Carr	do.	Do.
Ruth M. Dumire	do.	Do.
Virginia I. Graham	do.	Do.
Martha E. Hanulik	do.	Do.
Mary C. Harris	do.	Do.
Margaret Lang	do.	Do.
Vivian Rosenthal	do.	Do.
Rose Silver	do.	Do.

1/ Roof Control.

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C. J. Dalzell, Subdistrict Supervisor,
Johnstown, Pa.

Coal area covered--Pennsylvania (Bedford, Blair, Cambria, Centre, Clearfield, Clinton, Elk, Huntingdon, Indiana, Jefferson, Lycoming, Somerset, and Tioga Counties).

Stephen A. Andrejko, Jr.	Coal-mine inspector	Johnstown, Pa.
Wilburn C. Cagley	do.	Do.
W. M. Demkowicz	do.	Do.
William R. Devett	Electrical Engineer	Do.
William H. Hoover	Coal-mine inspector	Do.
James B. McCarty, Jr.	do.	Do.
Deward W. Moore	do.	Do.
Victor D. Null	do.	Do.
Don W. Snow	do.	Do.
De Jack Vittitow	Coal-mine inspector (RC)	Do.
Omar Elkins	Coal-mine inspector	Berlin, Pa.
Norman Rumburg	do.	Cherry Tree, Pa.
Patrick J. Beatty	do.	Clearfield, Pa.
Richard H. Reid	do.	Do.
Garrett M. Mortensen	do.	Ebensburg, Pa.
Walter D. Brown	do.	Indiana, Pa.
Samuel A. Magistrella	do.	Do.
William O. Montgomery	Coal-mine inspector (RC)	Do.
Frank A. Koza	Coal-mine inspector	Punxsutawney, Pa.
Harry L. Scott	do.	Do.
Charles H. Gaskill	do.	Spangler, Pa.
Freda Beaugez	Clerical	Johnstown, Pa.
L. Lucile Foltz	do.	Do.
Madeline M. Gelet	do.	Do.
Catherine Ann Naylor	do.	Do.
Dorothy M. Paxton	do.	Do.
Ethel P. Romeo	do.	Do.

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T. C. Higgins, Subdistrict Supervisor,
St. Clairsville, Ohio

Coal area covered--Ohio and West Virginia (Brooke, Hancock, Marshall, and Ohio Counties).

Richard E. Barr	Coal-mine inspector	St. Clairsville, Ohio
John Barry	do.	Do.
William J. Buswink	do.	Do.
John T. Callahan	do.	Do.
John S. Eakins	Coal-mine inspector (RC)	Do.
Edward J. Marron	Coal-mine inspector	Do.
William J. Symons	do.	Do.
Fred A. Williams	Coal-mine inspector (electrical)	Do.
John W. Zavora	Coal-mine inspector	Do.
Frank E. Hughes	do.	Athens, Ohio
Joseph C. Reardon	do.	Cambridge, Ohio
Elsa M. Cara	Clerical	St. Clairsville, Ohio
Mary E. Duffy	do.	Do.
Bernice S. Phillips	do.	Do.
Elaine H. Yoblinski	do.	Do.

Health and Safety District C

William R. Park, District Supervisor,
Mount Hope, W. Va.

Coal area covered--Mount Hope office--West Virginia (south of Jackson, Roane, Braxton, Webster, and Randolph Counties).

Thomas Allamon	Coal-mine inspector	Mount Hope, W. Va.
D. W. Barger	Coal-mine inspector (RC)	Do.
Robert W. Brown	Coal-mine inspector	Do.
Robert M. Cain	do.	Do.
Alpha B. Cavendish	do.	Do.
Charles C. Cavendish	do.	Do.
Arthur Charlesworth	do.	Do.
Maurice S. Childers	Coal-mine inspector (electrical)	Do.
William M. Cordray	Coal-mine inspector (RC)	Do.
Joseph S. Ferraro	Coal-mine inspector	Do.
Lloyd G. Fitzgerald	Coal-mine inspector (explosives)	Do.
Anthony J. Fumich	Coal-mine inspector (RC)	Do.
Frank J. Furin	Coal-mine inspector	Do.
F. J. Gallagher	Coal-mine inspector (electrical)	Do.
Sylvester E. Gaspersich	Coal-mine inspector	Do.
Denver S. Griffith	do.	Do.
James F. Haley	do.	Do.
Harold M. Hock	do.	Do.
Carl A. Kansala	do.	Do.
Fred E. Kemrite	Coal-mine inspector (RC)	Do.

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James R. Laird	Coal-mine inspector	Mount Hope, W. Va.
Luther A. Lewallen	do.	Do.
John Matsko	do.	Do.
Leo M. Morelli	do.	Do.
John C. Muir	do.	Do.
Claude E. Phillips	Health and Safety Engineer	Do.
Herschel Potter	Coal-mine inspector	Do.
Anthony Puskas	do.	Do.
Donovan G. Sanford	do.	Do.
Frank J. Stortz	do.	Do.
Paul Wills	do.	Do.
Paul T. Akers	do.	Logan, W. Va.
Robert Calvert	do.	Do.
Thomas W. Gay	do.	Do.
Hobart A. Jarvis	do.	Do.
William E. Stinnette	do.	Do.
Paul H. Tisdale	do.	Do.
Lex Trunko	do.	Do.
James T. Whalen	do.	Do.
David L. Brown, Jr.	do.	Montgomery, W. Va.
Gerald W. Croyle	do.	Do.
Raymond C. DeWeese	do.	Do.
Joseph A Woods	do.	Do.
Arthur L. Ulshafer	do.	Pineville, W. Va.
Morris E. Bragg	do.	Princeton, W. Va.
Michael J. Hovanec	do.	Do.
Edward M. Lewis	Coal-mine inspector (RC)	Do.
Denis C. McGinity	Coal-mine inspector	Do.
Elwood Menta	do.	Do.
William B. Michael	Coal-mine inspector (electrical)	Do.
James D. Micheal	Coal-mine inspector	Do.
George Noe	do.	Do.
William T. Trinkley	do.	Do.
Ward R. Vickers	do.	Do.
John Zeleskey	do.	Do.
Vernon Bowling	do.	Richwood, W. Va.
F. H. Henderson	do.	Summersville, W. Va.
Doris J. Bailey	Clerical	Mount Hope, W. Va.
Frances Dixon	do.	Do.
Anna Marie Falvo	do.	Do.
Louise V. Humphrey	do.	Do.
Ruth A. Kelly	do.	Do.
Patsy S. Lawton	do.	Do.
Margaret L. McCool	do.	Do.
Pasquale Pino	Custodial	Do.
Helen V. Pomykata	Clerical	Do.
Vivian T. Robertson	do.	Do.
Montana P. Romine	do.	Do.
Betty Jean Rose	do.	Do.
Rosa Anna Stella	do.	Do.
Maybelle C. Weaver	do.	Do.

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John J. Dougherty, Subdistrict Supervisor,
Morgantown, W. Va.

Coal area covered--Maryland and West Virginia (north of Mason, Kanawha, Clay, Nicholas, and Pocahontas Counties and south of Marshall County).

William D. Baldwin	Coal-mine inspector	Morgantown, W. Va.
Jay C. Davis	do.	Do.
William C. Eiduke	do.	Do.
Roy C. Estep	do.	Do.
John C. Hartley	Coal-mine inspector (RC)	Do.
Charles D. McMaster	Coal-mine inspector (electrical)	Do.
Louis E. O'Connor	Coal-mine inspector	Do.
Joseph F. Orlando	do.	Do.
George M. Reid	do.	Do.
Henry Strubeck	do.	Do.
Thomas J. Ward	do.	Buckhannon, W. Va.
William R. Melville	do.	Clarksburg, W. Va.
Joseph Marshalek	do.	Elkins, W. Va.
Joseph J. Dobis	do.	Fairmont, W. Va.
Matthew I. Duncan	do.	Do.
John E. Jones	do.	Do.
Harry Jones	Coal-mine inspector (RC)	Frostburg, Md.
Paul M. Shay	Coal-mine inspector	Grafton, W. Va.
Warden L. Evans	do.	Kingwood, W. Va.
Mary K. Elsey	Clerical	Morgantown, W. Va.
Patricia C. Jamison	do.	Do.
Teresa M. Jones	do.	Do.
Irmadell A. Pugh	do.	Do.

Health and Safety District D

Milton C. McCall, District Supervisor,
Birmingham, Ala.

Coal area covered--Birmingham office--Alabama, Georgia, and North Carolina.

William Arthur	Coal-mine inspector	Birmingham, Ala.
Donald Bowker	Coal-mine inspector (RC)	Do.
Arthur Guthrie	Coal-mine inspector	Do.
Carl F. Kahre	do.	Do.
Wilbur G. McCrary	do.	Do.
Haskel E. Melhorn	do.	Do.
Joe A. Rejonis	do.	Do.
Harry N. Smith	Coal-mine inspector (RC)	Do.
Anna M. Fox	Clerical	Do.
Catherine W. Ray	do.	Do.
Willette B. Tennent	do.	Do.

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Eric H. Brown, Subdistrict Supervisor,
Jellico, Tenn.

Coal area covered--Tennessee

Stephen J. Bukovitz	Coal-mine inspector	Jellico, Tenn.
Charles E. Estep	Coal-mine inspector (electrical)	Do.
Fornie A. Jordan	Coal-mine inspector (RC)	Do.
Joseph Neal	Coal-mine inspector	Do.
Wilbur E. Stiles	do.	Do.
Dee Zimmerman	Coal-mine inspector (RC)	Do.
Herbert D. Couk	Coal-mine inspector	Crossville, Tenn.
Jack Reese	do.	Do.
Ira Amburgey	do.	Jasper, Tenn.
Brooks Blackwood	do.	Do.
John D. Martin	do.	Do.
Lucille Light	Clerical	Jellico, Tenn.
Lois G. Trammel	do.	Do.
Nona S. Vermillion	do.	Do.
Gladys M. Warming	do.	Do.

Health and Safety District E

Francis J. Smith, District Supervisor,
Vincennes, Ind.

Coal area covered--Illinois, Iowa, Indiana, Kentucky (West of Frankfort), and Missouri.

Sanford J. Douglas	Coal-mine inspector (electrical)	Vincennes, Ind.
Clement M. Dovidas	Coal-mine inspector	Do.
James A. O'Connor	Health and safety engineer	Do.
James A. McCune	Coal-mine inspector	Do.
James P. Sheridan	Coal-mine inspector (RC)	Do.
Richard W. Whittaker	do.	Do.
T. Alvin Scully	Coal-mine inspector	Belleville, Ill.
Ben J. Dona	do.	Benton, Ill.
Andrew J. Kopp	do.	Do.
M. R. Messersmith	Coal-mine inspector (RC)	Do.
Joseph R. Summary	Coal-mine inspector	Do.
Henry E. Basinger	do.	Madisonville, Ky.
Brank Beck	do.	Do.
Clifton Dupree	Coal-mine inspector (RC)	Do.
Walter W. Kessler	Coal-mine inspector	Springfield, Ill.
Frank Perz	do.	Terre Haute, Ind.
George W. Hammons	do.	Moberly, Mo.
Clara M. Dreiman	Clerical	Vincennes, Ind.
Anna C. Kaiser	do.	Do.
Lucile H. Martin	do.	Do.
Mary E. Meyer	do.	Do.
Leonard W. Pieper	do.	Do.
Cecelia C. Speth	do.	Do.
Georgia L. Van Lieu	do.	Do.
Margarett Reeves	do.	Do.

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Health and Safety District G

George M. Kintz, District Supervisor,
Dallas, Tex.

Robert D. Bradford, Subdistrict Supervisor,
McAlester, Okla.

Coal area covered--Oklahoma, Arkansas, Kansas, and Texas

W. Marion Baker	Coal-mine inspector (electrical)	McAlester, Okla.
Michael Deak, Jr.	Coal-mine inspector	Do.
Wynemia J. Dollins	Clerical	Do.
Mignonette W. Grantham	do.	Do.

Health and Safety District H

J. Howard Bird, District Supervisor,
Denver, Colo.

Coal area covered--Colorado, Montana, New Mexico, North Dakota, South Dakota, and Wyoming (Carbon, Converse, Campbell, Sheridan, Fremont, and Hot Springs Counties)

J. J. Bastalich, Jr.	Coal-mine inspector	Denver, Colo.
A. Z. Dimitroff	Health and safety engineer (electrical)	Do.
George B. Fritts	Coal-mine inspector	Do.
A. C. Moschetti	Coal-mine inspector supv.	Do.
D. R. Ratkovich	Coal-mine inspector	Do.
I. J. Ratliff	do.	Do.
Robert T. Reay	do.	Do.
E. L. Christensen	do.	Billings, Mont.
William Roberts	do.	Grand Junction, Colo.
Carl T. Hallett	do.	Trinidad, Colo.
Marie Chambers	Clerical	Denver, Colo.
B. Irene Foreman	do.	Do.
Dorothy Kennedy	do.	Do.
Inez W. Lundy	do.	Do.

Anchorage, Alaska

Coal area covered--Alaska

Percy C. Van Natter	Coal-mine inspector	Anchorage, Alaska
Mary T. Edgar	Clerical	Do.

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L. D. Knill, Subdistrict Supervisor,
Salt Lake City, Utah

Coal area covered--Idaho, Utah, and Wyoming
(All Counties not covered by Denver)

E. J. Grillos	Health and safety engineer	Salt Lake City, Utah
Joseph Freeman	Coal-mine inspector	Price, Utah
Albert C. Husted	do.	Do.
Thomas T. Reay, Jr.	do.	Do.
Ione R. Ayre	Clerical	Salt Lake City, Utah
A. D. Speakman	do.	Do.

L. H. McGuire, Subdistrict Supervisor,
Seattle, Wash.

Coal area covered--Washington and Oregon

Coal-mine inspectors assigned from the Denver office.

Health and Safety District I

J. S. Malesky, District Supervisor,
Norton, Va.

Coal area covered--Virginia and those parts of eastern Kentucky east of Elliott, Morgan, Magoffin, and Knott Counties and parts of Letcher, Floyd, and Harlan Counties east of Whitesburg, Prestonburg, and Cumberland.

Leslie E. Allen	Coal-mine inspector	Norton, Va.
Houston C. Brumbaugh	do.	Do.
Patrick J. Buchanan	do.	Do.
John H. Clawson	do.	Do.
George W. Colbert	do.	Do.
Francis A. Cress	do.	Do.
John G. Emershaw	do.	Do.
George L. Mears	do.	Do.
Peter F. Stevenson	Coal-mine inspector (RC)	Do.
William R. Stewart	Coal-mine inspector	Do.
Carl E. Stinnette	Coal-mine inspector (electrical)	Do.
James L. Thornsberry	Coal-mine inspector	Do.
Monroe L. West	do.	Do.
John F. Wilson	do.	Do.
George M. Betchey	do.	Big Stone Gap, Va.
Robert L. Cochran	do.	Do.
C. Leslie Bailey	do.	Grundy, Va.
R. L. Ellis	do.	Do.
Harold R. Baker	do.	Pikeville, Ky.
William R. Burgess	do.	Do.

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Clyde W. Casey	Coal-mine inspector	Pikeville, Ky.
Oscar W. Harris	do.	Do.
Calvin F. Watson	do.	Do.
Walter M. Allen	do.	Richlands, Va.
Charles B. Aspinwall	do.	Do.
James W. Cromwell	do.	Do.
John J. Pendergast, Jr.	do.	Do.
Harold H. Wiley	do.	Do.
Jewell B. Ball	Clerical	Norton, Va.
Clara K. Banks	do.	Do.
Fannie M. Bevins	do.	Do.
Lundia S. Clark	do.	Do.
Marilyn L. Dixon	do.	Do.
Joan Green	do.	Do.
Billy W. Greene	do.	Do.
Phyllis P. Hatcher	do.	Do.
Eleanor M. Moore	do.	Do.
Martha C. Smith	do.	Do.
Sara Wampler	do.	Do.

George W. Parry, Subdistrict Supervisor,
Barbourville, Ky.

Coal area covered--Kentucky east of Frankfort and west of and including Elliott, Morgan, Magoffin, and Knott Counties and parts of Letcher, Floyd, and Harlan Counties west of Whitesburg, Prestonburg, and Cumberland.

William E. Duke	Coal-mine inspector (electrical)	Barbourville, Ky.
Jay D. Farris	Coal-mine inspector	Do.
Morris J. Hughes	do.	Do.
Clarence E. Hyde	do.	Do.
Fred Jones	do.	Do.
Ralph B. Jones	Coal-mine inspector (RC)	Do.
Clay Pate	Coal-mine inspector	Do.
Thomas A. Redin	do.	Do.
Dennie R. Hager	do.	Harlan, Ky.
Thomas R. Mark, Jr.	do.	Do.
Nester L. Adams	Coal-mine inspector (RC)	Hazard, Ky.
Noah B. Close	Coal-mine inspector	Do.
Chester A. Latham	do.	Do.
Raymond Linville	do.	Do.
George W. Luke	do.	Do.
Hobart B. Lynch	do.	Do.
Carla S. Combs	Clerical	Barbourville, Ky.
Janie T. Hammons	do.	Do.
Georgia S. Jefferson	do.	Do.
Jewel M. Jones	do.	Do.
Ina L. McDonald	do.	Do.
Wilma L. Wilson	do.	Do.

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WASHINGTON OFFICE STAFF

BUREAU OF MINES

Marling J. Ankeny, Director

James Westfield, Assistant Director--Health and Safety

DIVISION OF COAL-MINE INSPECTION

H. F. Weaver, Chief

Raymon K. Franklin	Technical assistant
Charles M. Keenan	Do.
Harry A. Schrecengost	Do.
George M. Smith	Do.
Dorothy M. Alden	Clerical
Rose Merriam Bell	Do.
Margaret A. Bobby	Do.
Martha E. Patton	Do.
Perna A. Zott	Do.

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TABLE 2. - Distribution of coal-mine inspectors and electrical inspectors, Dec. 31, 1959

Field office	Coal-mine inspectors						Coal-mine electrical inspectors			
	GS-9	GS-11	GS-12	GS-13	GS-14	Total	GS-9	GS-11	GS-12	Total
Wilkes-Barre, Pa....	-	1	20	-	1	22	-	-	-	0
Pittsburgh, Pa.....	3	-	21	-	1	25	-	-	1	1
Johnstown, Pa.....	1	-	19	1	-	21	-	-	-	0
St. Clairsville,Ohio	-	-	10	1	-	11	-	-	1	1
Mt. Hope, W. Va.....	6	-	47	-	1	54	-	1	2	3
Morgantown, W. Va...	-	-	18	1	-	19	-	-	1	1
Birmingham, Ala.....	-	-	8	-	1	9	-	-	-	0
Jellico, Tenn.....	-	-	10	1	-	11	-	1	-	1
Vincennes, Ind.....	-	-	15	-	1	16	-	-	1	1
McAlester, Okla.....	-	-	1	1	-	2	-	-	1	1
Denver, Colo.....	-	-	8	1	1	10	-	-	-	0
Salt Lake City, Utah	-	-	3	1	-	4	-	-	-	0
Seattle, Wash.....	-	-	-	-	-	0	-	-	-	0
Anchorage, Alaska...	-	-	1	-	-	1	-	-	-	0
Norton, Va.....	2	-	25	-	1	28	-	-	1	1
Barbourville, Ky....	1	-	14	1	-	16	-	-	1	1
General.....	-	-	-	4	-	4	-	-	-	0
Total.....	13	1	220	12	7	1/253	0	2	9	11

1/ Includes:
7 District Supervisors (excluding Districts F and G).
8 Subdistrict Supervisors (excluding Seattle, Wash., Phoenix, Ariz., San Francisco, Calif., and Albany, N.Y.).
4 Technical Assistants (Washington, D.C.).

TABLE 3. - Distribution of engineers, Dec. 31, 1959

Field office	GS-9	GS-11	GS-12	GS-13	GS-14	GS-15	Total
Wilkes-Barre, Pa.....	-	-	-	-	-	-	0
Pittsburgh, Pa.....	-	-	1	4	-	-	5
Johnstown, Pa.....	-	-	1	-	-	-	1
St. Clairsville, Ohio.....	-	-	-	-	-	-	0
Mt. Hope, W. Va.....	-	1	-	-	-	-	1
Morgantown, W. Va.....	-	-	-	-	-	-	0
Birmingham, Ala.....	-	-	-	-	-	-	0
Jellico, Tenn.....	-	-	-	-	-	-	0
Vincennes, Ind.....	-	-	-	1	-	-	1
McAlester, Okla.....	-	-	-	-	-	-	0
Denver, Colo.....	-	-	1	-	-	-	1
Salt Lake City, Utah.....	-	-	1	-	-	-	1
Phoenix, Ariz.....	-	-	-	-	-	-	0
Seattle, Wash.....	-	-	-	-	-	-	0
Anchorage, Alaska.....	-	-	-	-	-	-	0
Norton, Va.....	-	-	-	-	-	-	0
Barbourville, Ky.....	-	-	-	-	-	-	0
General.....	-	-	-	-	-	1	1
Total.....	-	1	4	5	-	1	11

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APPENDIX B

TABLE 1. - Details of inspection data, Title II mines, 1959, by districts and subdistricts

District	Field office	Title II mine inspections	Joint State-Federal inspections 1/	Violations Title II observed	Mines at which Form B notices were issued	Notices issued			Orders issued			Mines at which orders were issued		Mines free of violations of Title II	Title II mines inspected	Mines free of Title II and code violations during same inspection
						Form B (original)	Form C Violations abated	Form C Time extended	Form A sec. 203(a)	Form D sec. 203(c)	Form B-1 sec. 203(d)	Form A	Form D			
A	Wilkes-Barre, Pa.	165	0	168	7	11	11	21	22	0	1	16	0	47	68	3
B	Pittsburgh, Pa...	141	0	402	7	11	9	4	2	1	0	1	1	13	69	3
	Johnstown, Pa....	175	0	485	9	13	13	3	0	0	1	0	0	26	68	2
	St. Clairsville, Ohio.....	89	0	227	4	4	4	0	0	0	0	0	0	4	36	1
C	Mt. Hope, W. Va..	680	0	2,202	127	314	305	70	11	9	0	9	5	35	294	1
	Morgantown, W.Va.	283	0	515	3	5	5	0	2	0	0	2	0	58	111	0
D	Birmingham, Ala..	65	0	86	4	14	11	5	0	3	1	0	2	15	26	6
	Jellico, Tenn....	53	0	156	11	34	33	12	1	1	1	1	1	6	21	0
E	Vincennes, Ind...	237	0	592	21	51	49	16	5	0	3	3	0	25	83	2
G	McAlester, Okla..	21	13	24	0	0	0	0	2	0	0	2	0	6	7	2
H	Denver, Colo.....	56	0	92	6	11	11	2	3	1	0	3	1	11	24	1
	Salt Lake City, Utah.....	53	7	118	2	3	2	0	4	1	1	3	1	4	19	2
	Seattle, Wash....	12	12	16	1	1	0	0	0	0	0	0	0	0	5	0
	Anchorage, Alaska	4	4	3	1	3	3	0	0	0	0	0	0	2	2	0
I	Norton, Va.....	388	0	867	91	201	198	12	6	2	4	4	1	54	168	1
	Barbourville, Ky.	328	0	1,072	93	329	314	32	1	18	2	1	8	13	144	0
	Total.....	2,750	36	7,025	387	1,005	968	177	59	36	14	45	20	319	1,145	24

1/ Included in Title II mine inspections.

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TABLE 2. - Details of inspection data, Title II mines, 1959, by States

State	Title II mine inspections	Joint State-Federal inspections1/	Violations Title II observed	Mines at which Form B notices were issued	Notices issued			Orders issued			Mines at which orders were issued		Mines free of violations of Title II	Title II mines inspected	Mines free of Title II and code violations during same inspection
					Form B (original)	Form C Violations abated	Form C Time extended	Form A sec. 203(a)	Form D sec. 203(c)	Form B-1 sec. 203(d)	Form A	Form D			
Alabama.....	65	0	86	4	14	11	5	0	3	1	0	2	15	26	6
Alaska.....	4	4	3	1	3	3	0	0	0	0	0	0	2	2	0
Arizona.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arkansas.....	8	0	16	0	0	0	0	1	0	0	1	0	2	3	0
Colorado.....	47	0	81	6	11	11	2	3	1	0	3	1	8	19	1
Georgia.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Illinois.....	104	0	256	7	13	13	6	4	0	1	2	0	7	37	0
Indiana.....	35	0	196	9	29	28	4	0	0	1	0	0	0	12	0
Iowa.....	13	0	0	0	0	0	0	0	0	0	0	0	5	5	0
Kansas.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kentucky.....	509	0	1,439	107	365	349	37	2	18	3	2	8	42	221	1
Maryland.....	8	0	3	0	0	0	0	0	0	0	0	0	3	4	0
Missouri.....	15	0	4	1	1	1	1	0	0	0	0	0	4	4	1
Montana.....	5	0	6	0	0	0	0	0	0	0	0	0	3	2	0
New Mexico...	4	0	5	0	0	0	0	0	0	0	0	0	0	3	0
North Dakota.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ohio.....	75	0	192	4	4	4	0	0	0	0	0	0	4	30	1
Oklahoma.....	13	13	8	0	0	0	0	1	0	0	1	0	4	4	2
Oregon.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pa. (anth.)..	165	0	168	7	11	11	21	22	0	1	16	0	47	68	3
Pa. (bit.)...	316	0	887	16	24	22	7	2	1	1	1	1	39	137	5
South Dakota.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tennessee....	53	0	156	11	34	33	12	1	1	1	1	1	6	21	0
Texas.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Utah.....	46	0	105	2	3	2	0	4	1	1	3	1	3	16	2
Virginia.....	277	0	636	81	173	170	12	6	2	4	4	1	34	116	1
Washington...	12	12	16	1	1	0	0	0	0	0	0	0	0	5	0
West Virginia	969	0	2,749	130	319	310	70	13	9	0	11	5	90	407	1
Wyoming.....	7	7	13	0	0	0	0	0	0	0	0	0	1	3	0
Total...	2,750	36	7,025	387	1,005	968	177	59	36	14	45	20	319	1,145	24

1/ Included in Title II mine inspections.

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TABLE 3. - Withdrawal orders issued under sec. 203(a) for imminent dangers, by States, July 16, 1952-Dec. 31, 1959

Conditions constituting imminent danger	Alabama	Alaska	Arkansas	Colorado	Illinois	Indiana	Kansas	Kentucky	Montana	Missouri	New Mexico	Ohio	Oklahoma	Pa. (anth.)	Pa. (bit.)	Tennessee	Utah	Virginia	Washington	West Virginia	Total
Man-trip:																					
Dangerous roof	-	1	-	-	3	-	-	5	3	-	-	1	-	-	2	5	-	23	-	18	61
Poor track and equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	2
Poor track and dangerous roof	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Man-hoist:																					
Worn rope	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Shaft partition and/or cages deteriorated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Mine fire:																					
Active fire adjacent to or in producing area	-	3	-	3	4	1	-	5	-	-	1	-	-	15	5	2	8	1	-	24	72
Electric-arc hazards and accumulated coal and coal dust	-	-	1	-	2	-	-	8	-	-	-	-	-	-	-	-	-	4	-	3	18
Poor electrical installations	-	-	-	-	1	-	1	1	-	-	-	-	-	-	-	-	-	6	-	5	14
Loose coal, inadequate ventilation	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	3
Black powder, no rock dust, no fire-fighting equipment	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
No fire-fighting equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	4
Fire at blowing fan on surface	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Loose coal and coal dust, inadequate rock dust, blasting off solid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Blasting off solid, combustible material, smoking, open lights, etc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2
Explosion:																					
Excessive methane liberations	-	-	-	1	1	1	-	-	-	-	-	-	-	1	-	-	2	-	-	-	6
Methane and dust accumulations	-	-	-	-	4	2	-	-	-	-	-	-	1	-	-	-	-	-	-	1	8
Methane accumulations	-	-	-	-	2	2	1	2	-	-	-	2	-	26	5	-	1	1	-	1	43
Leak in surface gasoline line	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Inadequate rock dusting	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	5	7
Coal-dust accumulations, no rock dust	-	-	2	3	7	-	-	3	-	-	-	-	1	-	-	1	-	7	-	17	41
Active mine fire	-	-	-	-	5	1	-	2	-	-	-	-	1	5	2	-	4	-	-	1	21
Black powder and inadequate rock dusting	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Explosion disrupted ventilation	1	1	1	1	-	-	-	-	-	-	-	-	-	1	2	-	2	-	2	4	15
Coal-dust stemming, no gas tests, doors open	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	2
Excessive methane in air currents	-	-	3	-	-	2	-	-	-	-	-	-	1	-	-	-	1	-	-	1	8
Approaching gas-filled sealed areas	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Inadequate ventilation	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	1	4
Coal-dust accumulations and electric-arc hazards	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	4	-	4	10
No gas examinations, open lights, smoking, inadequate ventilation, etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2
No preshift examinations, inadequate rock dusting	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Inundation:																					
Working under body of water	-	-	1	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-	4
Advancing toward abandoned workings	-	-	-	-	-	-	-	2	-	-	-	-	-	1	-	2	-	3	-	-	8
Inflow of oxygen-deficient air and/or carbon dioxide	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	4
Impounded water	-	-	-	-	-	1	-	-	-	-	-	-	1	2	-	-	-	-	-	-	4
Inflow of surface wash and/or water	-	-	1	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	1	1	16
Total	1	5	9	9	32	10	2	34	4	1	1	3	6	68	19	13	20	60	3	90	390

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TABLE 4. - Withdrawal orders issued under sec. 203(c) for failure to abate violations of sec. 209, by States, July 16, 1952-Dec. 31, 1959

Section violated	Alabama	Arkansas	Colorado	Illinois	Indiana	Iowa	Kentucky	Missouri	Ohio	Oklahoma	Pa. (anth.)	Pa. (bit.)	Tennessee	Utah	Virginia	West Virginia	Total
209(c).....	1	-	-	-	-	-	13	-	-	-	-	3	-	-	4	9	30
209(d)(1).....	4	1	-	1	-	-	52	1	1	-	6	7	5	-	10	12	100
209(d)(2).....	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
209(d)(3).....	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
209(d)(4).....	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
209(d)(6).....	-	-	-	3	-	-	1	-	-	-	-	1	-	-	-	4	9
209(d)(7).....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2
209(d)(8).....	-	-	-	-	-	-	27	-	1	-	-	1	-	-	1	1	31
209(d)(9).....	-	-	-	1	1	-	4	-	-	-	-	-	-	-	-	2	8
209(e)(1).....	-	-	-	2	-	-	23	-	-	-	-	9	2	1	13	14	64
209(e)(3).....	1	-	1	1	1	4	34	-	1	-	-	3	2	-	10	8	66
209(e)(4).....	-	-	-	-	-	-	6	-	-	-	-	2	1	-	-	2	11
209(e)(5).....	-	-	1	-	1	-	24	-	-	-	-	13	4	-	19	14	76
209(f)(1).....	-	-	-	-	-	-	1	-	-	-	-	3	-	-	-	2	6
209(g)(1).....	-	-	1	1	-	-	10	-	-	-	-	2	-	-	3	7	24
209(g)(5).....	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
209(h)(2).....	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	2	5
209(h)(4).....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
209(h)(5).....	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	4
209(h)(7).....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Total.....	6	1	3	12	3	6	195	1	3	1	8	44	14	3	64	78	442

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APPENDIX C

Appeals to the Director on which hearings were necessary under sec. 206 and appeals to the Federal Coal Mine Safety Board of Review under sec. 207, July 16, 1952-Dec. 31, 1959

Mine and company	Reason for appeal	Disposition	
		Director[1]	Board
	Sec. 203(d) orders		
Maxton Slope, Morrisdale Mining Co., Hawk Run, Pa.	Gassy classification.		Appeal denied 10/18/52.
Glenmar No. 1, Moshannon/Smithing Coal Co. Beccaria, Pa.	do.	Appeal denied 12/31/52.	Appeal denied 2/24/53.
Ponfeigh Pine Hill, Ponfeigh Pine Hill Smokeless Coal Co., Garrett, Pa.	do.	Order annulled 3/2/53.	
Seaboard No. 1, Rebecca Coal Co., Richlands, Va.	do.	Appeal denied 6/16/53.	Order annulled 12/3/53.
Carnegie, Clean Coal Co., Bellaire, Ohio.	do.	Appeal denied (application not made within 20 days).	
Haws No. 7, Haws Refractories Co., Johnstown, Pa.	do.	Appeal denied 8/10/53.	
Princess No. 2, Princess Elkhorn Coal Co., Permele, Ky.	do.	Order annulled 2/11/54.	
Princess No. 2, Princess Elkhorn Coal Co., Permele, Ky.	do.	Appeal denied 10/15/54.	Order annulled 1/28/55; appealed to Court; Board decision affirmed 10/24/55.
Wheelwright, Inland Steel Co., Inc. Wheelwright, Ky.	do.	Appeal denied 3/1/55.	Appealed 3/22/55; interlocutory order 4/10/56; order applied to No. 3 mine only 9/13/56.

1/ Blank space means appeal taken directly to Board.

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Mine and company	Reason for appeal	Disposition Director1/	Board
Banner No. 2 Banner Fuel Corp., Cranes Nest, Va.	Gassy classification.	Appeal denied 3/28/55.	
Buchanan No. 4 Buchanan County Coal Corp., Big Rock, Va.	do.	Appeal denied 1/20/55.	
No. 6, Caldonia Coal Co., Norton, Va.	do.	Appeal denied 3/11/55.	
No. 2 Harlan-Wallins Coal Corp., Evarts, Harlan County, Ky.	do.	Appeal denied 5/11/55.	Appeal denied 7/30/55.
Kildee No. 3 Pschirrer & Sons Coal Co., Canton, Ill.	do.	Order annulled 4/12/55.	
Portage No. 4 Miller Shaft Co., Portage, Pa.	do.	Order annulled 5/31/56.	
Rosedale No. 8, Rosedale Coal Co., Maidsville, W. Va.	do.	Appeal denied 12/17/56.	Appeal denied 3/1/57. Appealed to Court 3/27/57; Board decision affirmed 7/13/57.
North Point, St. Marys' Sewer Pipe Co., Dora, Jefferson County, Pa.	do.		Appeal denied 3/13/58. Appealed to Court 4/1/58; Board decision affirmed 1/16/59.
Sec. 203(c) orders			
Talleydale Snow Hill Coal Corp., Terre Haute, Ind.	Violation of sec. 209(d)(9).2/	Referred to Director by Board. Order annulled 8/4/53.	Appealed for temporary relief 6/5/52; time extended until 7/11/53.
Williams River No. 1 The Gauley Mountain Coal Co., Cowen, W. Va.	do.		Appeal denied 3/16/55; affirmed by court 7/30/55.

2/ Failure to test for gas before electrical equipment was taken beyond the last open crosscut.

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Mine and Company	Reason for appeal	Disposition Director[1/]	Disposition Board
Cassity, Nos. 2, 3, and 6 openings Three Fork Coal Co., Inc., Cassity, W. Va.	Violation of sec. 209(e)(1).		Order annulled 3/4/55; Court dismissed appeal.
Crucible Crucible Steel Company of America, Fuel Division, Crucible, Pa.	Violation of sec. 209(e)(5).		Appealed and relief granted 7/3/55; order annulled 11/23/55.
No. 14 mine Lone Star Steel Co. Bokoshe, Okla.	Violation of sec. 209(d)(3).		Order annulled 6/6/57.[3/]
	Sec. 203(a) orders		
Kleaner No. 1, Kleaner Coal Co., Bokoshe, Okla.	Explosion danger.		Order annulled 10/2/53.[3/]
Starr No. 2 Starr Coal, Inc., Henryetta, Okla.	do.		Order annulled 2/14/55.[3/]
Starr No. 2 Starr Coal, Inc., Henryetta, Okla.	do.		Order annulled 5/12/55.[3/]
No. 14 mine Lone Star Coal Co., Bokoshe, Okla.	do.		Order annulled 6/22/56.[3/]
Suntrana Healy River Coal Co., Suntrana, Alaska.	Mine-fire danger.		Order annulled 10/26/59.[3/]
Suntrana Healy River Coal Co., Suntrana, Alaska.	do.		Order annulled 10/26/59.[3/]
No. 14 mine Lone Star Coal Co., Bokoshe, Okla.	Inundation.		Order annulled 11/21/59.[3/]

3/ State-participation plan in effect. No appeal to Director permitted.

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APPENDIX D

TABLE 1. - Number of active coal mines in the Nation, 1959, by districts and subdistricts

District	Field office	Title I mines				Title II mines	Total mines
		Strip	Auger	Underground	Total		
A.....	Wilkes-Barre, Pa.....	135	0	723	858	77	935
B.....	Pittsburgh, Pa.....	233	11	275	519	71	590
	Johnstown, Pa.....	352	14	773	1,139	67	1,206
	St. Clairsville, Ohio	184	41	189	414	36	450
C.....	Mt. Hope, W. Va.....	30	50	1,025	1,105	323	1,428
	Morgantown, W. Va....	61	10	295	366	108	474
D.....	Birmingham, Ala.....	39	3	243	285	27	312
	Jellico, Tenn.....	67	14	599	680	24	704
E.....	Vincennes, Ind.....	213	4	138	355	87	442
G.....	McAlester, Okla.....	32	0	26	58	7	65
H.....	Denver, Colo.....	84	0	169	253	25	278
	Salt Lake City, Utah.	1	0	33	34	19	53
	Seattle, Wash.....	2	0	9	11	5	16
	Anchorage, Alaska....	8	0	1	9	2	11
I.....	Norton, Va.....	68	54	2,002	2,124	186	2,310
	Barbourville, Ky.....	50	50	1,100	1,200	144	1,344
	National data..	1,559	251	7,600	9,410	1,208	10,618

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TABLE 2. - Number of active coal mines in the Nation, 1959, by States

State	Title I mines				Title II mines	Total mines
	Strip	Auger	Underground	Total		
Alabama	39	3	237	279	27	306
Alaska	8	0	1	9	2	11
Arizona	0	0	2	2	0	2
Arkansas	8	0	15	23	3	26
Colorado	7	0	100	107	20	127
Georgia	0	0	6	6	0	6
Illinois	62	3	39	104	37	141
Indiana	36	0	21	57	13	70
Iowa	30	0	22	52	7	59
Kansas	7	0	2	9	0	9
Kentucky	134	73	2,041	2,248	225	2,473
Maryland	24	0	44	68	4	72
Missouri	30	0	20	50	4	54
Montana	19	0	29	48	2	50
New Mexico	1	0	30	31	3	34
North Dakota	47	0	3	50	0	50
Ohio	179	41	183	403	30	433
Oklahoma	15	0	9	24	4	28
Oregon	0	0	1	1	0	1
Pa. (anth.)	135	0	723	858	77	935
Pa. (bit.)	585	25	1,048	1,658	138	1,796
South Dakota	2	0	0	2	0	2
Tennessee	67	14	599	680	24	704
Texas	2	0	0	2	0	2
Utah	0	0	29	29	16	45
Virginia	39	32	1,097	1,168	131	1,299
Washington	2	0	8	10	5	15
West Virginia	72	60	1,282	1,414	433	1,847
Wyoming	9	0	9	18	3	21
Total	1,559	251	7,600	9,410	1,208	10,618

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TABLE 3. - Number of regular inspections, surveys, and miscellaneous investigations and inspections

Period	District	Field office	Regular inspections			Surveys					Investigations of injuries and disasters	Miscellaneous investigations	Spot-check inspections
			Original	Reinspections	Total	Electrical	Explosives	Ventilation	Float dust	Rock dusting			
1941-58	All	All.....	25,955	89,364	115,319	445	249	64	42	38	5,348	1/2,253	1/2,050
1959...	A	Wilkes-Barre, Pa..	196	709	905	0	0	0	0	0	52	30	39
	B	Pittsburgh, Pa....	72	441	513	1	0	0	0	0	49	58	0
		Johnstown, Pa.....	156	780	936	1	0	0	0	0	27	21	9
		St. Clairsville, Ohio.....	67	544	611	3	0	0	0	0	17	57	3
	C	Mount Hope, W. Va.	419	1,168	1,587	2	0	12	0	0	107	156	51
		Morgantown, W. Va.	106	683	789	0	0	0	0	0	34	0	52
	D	Birmingham, Ala...	66	443	509	0	0	0	0	0	17	0	9
		Jellico, Tenn.....	186	547	733	0	0	0	0	0	18	31	3
	E	Vincennes, Ind....	35	573	608	3	0	0	0	0	38	89	39
	G	McAlester, Okla...	7	82	89	0	0	0	0	0	4	7	13
	H	Denver, Colo.....	15	294	309	2	0	0	0	0	5	12	15
		Salt Lake City, Utah.....	4	91	95	0	0	0	0	0	8	7	4
		Seattle, Wash.....	1	21	22	0	0	0	0	0	1	1	1
		Anchorage, Alaska.	1	16	17	1	0	0	0	2	2	6	3
	I	Norton, Va.....	521	1,485	2,006	0	0	0	0	0	41	65	5
		Barbourville, Ky..	408	913	1,321	0	0	0	0	0	27	20	1
		1959 total.....	2,260	8,790	11,050	13	0	12	0	2	447	560	247
		Grand total.	28,215	98,154	126,369	458	249	76	42	40	5,795	2/2,813	2/2,297

1/ 1955-58 only.
2/ 1955-59 only.

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TABLE 4. - Active mines, mines inspected, regular inspections, and average inspections per active mine, by districts and subdistricts, 1959

District	Field office	Active mines[1/]					Mines inspected					Inspections made					Average inspection per active mine				
		A	B	C	D	Total	A	B	C	D	Total	A	B	C	D	Total	A	B	C	D	Total
A	Wilkes-Barre, Pa..	135	0	723	77	935	67	0	621	68	756	68	0	672	165	905	0.5	0.0	0.9	2.1	1.0
B	Pittsburgh, Pa....	233	11	275	71	590	112	12	242	69	435	112	12	248	141	513	.5	1.1	.9	2.0	.9
	Johnstown, Pa.....	352	14	773	67	1,206	216	9	486	68	779	233	9	519	175	936	.7	.6	.7	2.6	.8
	St. Clairsville, Ohio.....	184	41	189	36	450	167	34	172	36	409	168	34	320	89	611	.9	.8	1.7	2.5	1.4
C	Mt. Hope, W. Va...	30	50	1,025	323	1,428	25	43	801	294	1,163	25	43	839	680	1,587	.8	.9	.8	2.1	1.1
	Morgantown, W. Va.	61	10	295	108	474	61	10	286	111	468	62	10	434	283	789	1.2	1.0	1.5	2.6	1.7
D	Birmingham, Ala...	39	3	243	27	312	38	3	211	26	278	56	5	383	65	509	1.4	1.7	1.6	2.4	1.6
	Jellico, Tenn.....	67	14	599	24	704	46	12	509	21	588	47	12	621	53	733	.7	.9	1.0	2.2	1.0
E	Vincennes, Ind....	213	4	138	87	442	175	3	120	83	381	194	3	174	237	608	.9	.8	1.3	2.7	1.4
G	McAlester, Okla...	32	0	26	7	65	32	0	26	7	65	32	0	36	21	89	1.0	.0	1.4	3.0	1.4
H	Denver, Colo.....	84	0	169	25	278	56	0	155	24	235	58	0	195	56	309	.7	.0	1.2	2.2	1.1
	Salt Lake City, Utah.....	1	0	33	19	53	1	0	33	19	53	1	0	41	53	95	1.0	.0	1.2	2.8	1.8
	Seattle, Wash.....	2	0	9	5	16	2	0	7	5	14	2	0	8	12	22	1.0	.0	.9	2.4	1.4
	Anchorage, Alaska.	8	0	1	2	11	8	0	1	2	11	12	0	1	4	17	1.5	.0	1.0	2.0	1.5
I	Norton, Va.....	68	54	2,002	186	2,310	20	20	1,250	168	1,458	24	20	1,574	388	2,006	.4	.4	.8	2.1	.9
	Barbourville, Ky..	50	50	1,100	144	1,344	48	45	785	144	1,022	51	48	894	328	1,321	1.0	1.0	.8	2.3	1.0
	National data.	1,559	251	7,600	1,208	10,618	1,074	191	5,705	1,145	8,115	1,145	196	6,959	2,750	11,050	.7	.8	.9	2.3	1.0

1/ A, Strip mines; B, auger mines; C, Title I underground mines; D, Title II mines.
2/ Owing to intermittent operation or abandonment, it was not possible to inspect some mines.

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TABLE 5. - Active mines, mines inspected, regular inspections, and average inspections per active mine, by States, 1959

State	Active mines[1]					Mines inspected					Inspections made					Average inspection per active mine				
	A	B	C	D	Total	A	B	C	D	Total	A	B	C	D	Total	A	B	C	D	Total
Alabama.....	39	3	237	27	306	38	3	205	26	272	56	5	371	65	497	1.4	1.7	1.6	2.4	1.6
Alaska.....	8	0	1	2	11	8	0	1	2	11	12	0	1	4	17	1.5	.0	1.0	2.0	1.5
Arizona.....	0	0	2	0	2	0	0	2	0	2	0	0	2	0	2	.0	.0	1.0	.0	1.0
Arkansas.....	8	0	15	3	26	8	0	15	3	26	8	0	21	8	37	1.0	.0	1.4	2.7	1.4
Colorado.....	7	0	100	20	127	7	0	93	19	119	8	0	130	47	185	1.1	.0	1.3	2.4	1.5
Georgia.....	0	0	6	0	6	0	0	6	0	6	0	0	12	0	12	.0	.0	2.0	.0	2.0
Illinois.....	62	3	39	37	141	52	2	27	37	118	56	2	43	104	205	.9	.7	1.1	2.8	1.5
Indiana.....	36	0	21	13	70	35	0	20	12	67	36	0	24	35	95	1.0	.0	1.1	2.7	1.4
Iowa.....	30	0	22	7	59	25	0	21	5	51	25	0	40	13	78	.8	.0	1.8	1.9	1.3
Kansas.....	7	0	2	0	9	7	0	2	0	9	7	0	2	0	9	1.0	.0	1.0	.0	1.0
Kentucky.....	134	73	2,041	225	2,473	96	57	1,337	221	1,711	110	60	1,619	509	2,298	.8	.8	.8	2.3	.9
Maryland.....	24	0	44	4	72	24	0	41	4	69	24	0	47	8	79	1.0	.0	1.1	2.0	1.1
Missouri.....	30	0	20	4	54	17	0	18	4	39	20	0	27	15	62	.7	.0	1.4	3.8	1.1
Montana.....	19	0	29	2	50	18	0	26	2	46	18	0	28	5	51	.9	.0	.9	2.5	1.0
New Mexico...	1	0	30	3	34	1	0	27	3	31	1	0	28	4	33	1.0	.0	.9	1.3	1.0
North Dakota.	47	0	3	0	50	21	0	2	0	23	21	0	2	0	23	.4	.0	.7	.0	.5
Ohio.....	179	41	183	30	433	163	34	167	30	394	164	34	306	75	579	.9	.8	1.7	2.5	1.3
Oklahoma.....	15	0	9	4	28	15	0	9	4	28	15	0	13	13	41	1.0	.0	1.4	3.3	1.5
Oregon.....	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	.0	.0	1.0	.0	1.0
Pa. (anth.)..	135	0	723	77	935	67	0	621	68	756	68	0	672	165	905	.5	.0	.9	2.1	1.0
Pa. (bit.)...	585	25	1,048	138	1,796	328	21	728	137	1,214	345	21	767	316	1,449	.6	.8	.7	2.3	.8
South Dakota.	2	0	0	0	2	2	0	0	0	2	3	0	0	0	3	1.5	.0	.0	.0	1.5
Tennessee....	67	14	599	24	704	46	12	509	21	588	47	12	621	53	733	.7	.9	1.0	2.2	1.0
Texas.....	2	0	0	0	2	2	0	0	0	2	2	0	0	0	2	1.0	.0	.0	.0	1.0
Utah.....	0	0	29	16	45	0	0	29	16	45	0	0	37	46	83	.0	.0	1.3	2.9	1.8
Virginia.....	39	32	1,097	131	1,299	18	9	732	116	875	22	9	889	277	1,197	.6	.3	.8	2.1	.9
Washington...	2	0	8	5	15	2	0	6	5	13	2	0	7	12	21	1.0	.0	.9	2.4	1.4
West Virginia	72	60	1,282	433	1,847	66	53	1,051	407	1,577	67	53	1,240	969	2,329	.9	.9	1.0	2.2	1.3
Wyoming.....	9	0	9	3	21	8	0	9	3	20	8	0	9	7	24	.9	.0	1.0	2.3	1.1
Total...	1,559	251	7,600	1,208	10,618	1,074	191	5,705	1,145	2/8,115	1,145	196	6,959	2,750	11,050	.7	.8	.9	2.3	1.0

1/ A, Strip mines; B, auger mines; C, Title I underground mines; D, Title II mines.
2/ Owing to intermittent operation or abandonment, it was impossible to inspect some mines.

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TABLE 6. - Average man-days to complete regular inspections and reports, 1959

District	Field office	Title I mines				Title II mines		All mines	
		Strip and Auger		Underground					
		A[1]	B[2]	A[1]	B[2]	A[1]	B[2]	A[1]	B[2]
A	Wilkes-Barre, Pa..	0.7	0.5	1.1	0.7	5.0	0.8	1.7	0.7
B	Pittsburgh, Pa....	.8	.6	1.0	1.0	5.6	1.3	2.2	1.0
	Johnstown, Pa.....	.7	.5	.9	.9	4.6	1.3	1.5	.9
	St. Clairsville, Ohio.....	1.1	.5	1.1	.6	3.5	.8	1.4	.6
C	Mt. Hope, W. Va...	.7	.5	.7	.5	3.9	.8	2.1	.6
	Morgantown, W. Va.	.7	.6	1.0	.7	4.5	.8	2.2	.7
D	Birmingham, Ala...	.7	.3	.8	.4	4.4	.6	1.3	.4
	Jellico, Tenn.....	.6	.3	.9	.5	3.3	.8	1.0	.5
E	Vincennes, Ind....	1.0	.3	1.2	.3	4.8	.4	2.5	.4
G	McAlester, Okla...	2.0	.6	1.8	.4	5.7	1.3	2.8	.8
H	Denver, Colo.....	.8	.4	1.1	.6	3.0	.8	1.4	.6
	Salt Lake City, Utah.....	2.0	1.0	1.4	.7	3.8	.8	2.8	.8
	Seattle, Wash.....	.5	.5	1.0	.3	2.5	.8	1.8	.6
	Anchorage, Alaska.	2.3	.6	2.0	1.0	2.5	1.0	2.4	.7
I	Norton, Va.....	.9	.7	1.0	.6	2.5	.6	1.3	.6
	Barbourville, Ky..	.7	.3	.9	.5	2.3	.5	1.3	.5
	National data.	.9	.5	1.0	.6	3.8	.8	1.7	.6

1/ A--Average man-days to complete regular inspections; includes inspecting, traveling, preparing and posting preliminary reports or notices or orders, conferences with mine personnel, and preparing notes and sample cards; excludes special inspections.

2/ B--Average days for inspector to prepare rough draft of inspection report.

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TABLE 7. - Special inspections under Secs. 203 and 206 and average total man-days to complete an inspection, Title II mines, 1959

District	Field office	Special inspections	Man-days making special inspections		Regular inspections Title II mines[1/]	Average additional man-days per regular inspection	Average man-days per regular inspection[2/]	Average total time per Title II mine inspection
			Total	Average per special inspection				
A.....	Wilkes-Barre, Pa....	51	132	2.6	165	0.8	5.0	5.8
B.....	Pittsburgh, Pa.....	17	24	1.4	141	.2	5.6	5.8
	Johnstown, Pa.....	16	14	.9	175	.1	4.6	4.7
	St. Clairsville, Ohio.....	5	4	.8	89	.1	3.5	3.6
C.....	Mt. Hope, W. Va.....	225	225	1.0	680	.3	3.9	4.2
	Morgantown, W. Va...	5	15	3.0	283	.1	4.5	4.6
D.....	Birmingham, Ala.....	22	27	1.2	65	.4	4.4	4.8
	Jellico, Tenn.....	52	46	.9	53	.9	3.3	4.2
E.....	Vincennes, Ind.....	88	75	.9	237	.3	4.8	5.1
G.....	McAlester, Okla.....	5	16	3.2	21	.8	5.7	6.5
H.....	Denver, Colo.....	17	39	2.3	56	.7	3.0	3.7
	Salt Lake City, Utah	8	41	5.1	53	.8	3.8	4.6
	Seattle, Wash.....	1	1	1.0	12	.8	2.5	3.3
	Anchorage, Alaska...	2	4	2.0	4	1.0	2.5	3.5
I.....	Norton, Va.....	99	79	.8	388	.2	2.5	2.7
	Barbourville, Ky....	271	256	.9	328	.8	2.3	3.1
	National data: Inspection work...	884	998	1.1	2,750	.4	3.8	4.2
	Average time to write inspection report[2/]							0.8
	Total average time per Title II mine inspection							5.0

1/ See Appendix D, table 4.
2/ See Appendix D, table 6.

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TABLE 8. - Comparative inspection data, Title II mines, 1953-59

Year	Regular inspections	Special inspections	Violations of Title II observed	Notices issued Form B	Orders issued	
					Form A	Form D
1953.....	3,664	3,622	7,928	3,593	36	138
1954.....	3,894	2,727	8,012	2,933	58	76
1955.....	3,484	2,360	8,701	2,177	80	69
1956.....	3,648	1,355	9,469	1,389	49	47
1957.....	3,368	1,596	8,275	1,371	46	34
1958.....	3,171	1,065	7,384	1,152	58	29
1959.....	2,750	884	7,025	1,005	59	36

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APPENDIX E

TABLE 1. - Violations of the Federal Mine Safety Codes observed, 1959, by districts and subdistricts

District	Field office	Title I underground mines				Title II mines			
		Mines inspected[1]	Violations observed[2]	Average violations per mine inspected	Mines free of violations	Mines inspected[1]	Violations observed[2]	Average violations per mine inspected	Mines free of violations
A	Wilkes-Barre, Pa.....	621	7,216	11.6	1	68	917	13.5	3
B	Pittsburgh, Pa.....	242	5,132	21.2	0	69	1,040	15.1	4
	Johnstown, Pa.....	486	6,509	13.4	1	68	1,338	19.7	2
	St. Clairsville, Ohio	172	4,584	26.7	0	36	697	19.4	1
C	Mt. Hope, W. Va.....	801	12,286	15.3	0	294	4,793	16.3	3
	Morgantown, W. Va....	286	5,632	19.7	0	111	2,675	24.1	1
D	Birmingham, Ala.....	211	5,274	25.0	0	26	243	9.3	12
	Jellico, Tenn.....	509	8,702	17.1	0	21	480	22.9	0
E	Vincennes, Ind.....	120	1,863	15.5	0	83	1,311	15.8	5
G	McAlester, Okla.....	26	662	25.5	0	7	108	15.4	2
H	Denver, Colo.....	155	1,206	7.8	4	24	204	8.5	6
	Salt Lake City, Utah.	33	246	7.5	2	19	243	12.8	2
	Seattle, Wash.....	7	55	7.9	0	5	92	18.4	0
	Anchorage, Alaska....	1	9	9.0	0	2	12	6.0	1
I	Norton, Va.....	1,250	34,260	27.4	2	168	3,457	20.6	12
	Barbourville, Ky.....	785	17,251	22.0	0	144	2,891	20.1	0
	National data....	5,705	110,887	19.4	10	1,145	20,501	17.9	54

1/ See appendix D, table 4.
2/ Includes all violations observed during the first inspection made in 1959 and all new violations observed during subsequent inspections.

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TABLE 2. - Violations of the Federal Mine Safety Codes observed, 1959, by States

State	Title I underground mines				Title II mines			
	Mines inspected[1]	Violations observed[2]	Average violations per mine inspected	Mines free of violations	Mines inspected[1]	Violations observed[2]	Average violations per mine inspected	Mines free of violations
Alabama	205	5,134	25.0	0	26	243	9.3	12
Alaska	1	9	9.0	0	2	12	6.0	1
Arizona	2	9	4.5	0	0	0	0.0	0
Arkansas	15	428	28.5	0	3	74	24.7	0
Colorado	93	573	6.2	3	19	146	7.7	5
Georgia	6	140	23.3	0	0	0	.0	0
Illinois	27	277	10.3	0	37	472	12.8	1
Indiana	20	330	16.5	0	12	433	36.1	0
Iowa	21	480	22.9	0	5	78	15.6	0
Kansas	2	56	28.0	0	0	0	.0	0
Kentucky	1,337	28,870	21.6	2	221	3,786	17.1	8
Maryland	41	523	12.8	0	4	63	15.8	0
Missouri	18	307	17.1	0	4	63	15.8	1
Montana	26	297	11.4	1	2	33	16.5	0
New Mexico	27	239	8.9	0	3	25	8.3	1
North Dakota	2	36	18.0	0	0	0	.0	0
Ohio	167	4,440	26.6	0	30	609	20.3	0
Oklahoma	9	178	19.8	0	4	34	8.5	2
Oregon	1	2	2.0	0	0	0	.0	0
Pa. (anth.)	621	7,216	11.6	1	68	917	13.5	3
Pa. (bit.)	728	11,641	16.0	1	137	2,378	17.4	6
South Dakota	0	0	.0	0	0	0	.0	0
Tennessee	509	8,702	17.1	0	21	480	22.9	0
Texas	0	0	.0	0	0	0	.0	0
Utah	29	230	7.9	0	16	217	13.6	2
Virginia	732	23,110	31.6	0	116	2,827	24.4	7
Washington	6	53	8.8	0	5	92	18.4	0
West Virginia	1,051	17,539	16.7	0	407	7,493	18.4	5
Wyoming	9	68	7.6	2	3	26	8.7	0
National data.	5,705	110,887	19.4	10	1,145	20,501	17.9	54

1/ See appendix D, table 5.
2/ Includes all violations observed during the first inspection made in 1959 and all new violations observed during subsequent inspections.

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APPENDIX F

TABLE 1. - Violations of the Federal Mine Safety Codes abated during inspections, 1959, by districts and subdistricts

District	Field office	Title I underground mines				Title II mines			
		Violations observed	Violations recorded in reports	Violations abated during inspections	Violations abated during inspections, percent	Violations observed	Violations recorded in reports	Violations abated during inspections	Violations abated during inspections, percent
A	Wilkes-Barre, Pa....	7,216	7,046	170	2	917	591	326	36
B	Pittsburgh, Pa.....	5,132	4,822	310	6	1,040	496	544	52
	Johnstown, Pa.....	6,509	5,907	602	9	1,338	722	616	46
	St.Clairsville, Ohio	4,584	4,305	279	6	697	321	376	54
C	Mt. Hope, W. Va.....	12,286	11,300	986	8	4,793	2,393	2,400	50
	Morgantown, W. Va...	5,632	4,559	1,073	19	2,675	1,331	1,344	50
D	Birmingham, Ala.....	5,274	5,138	136	3	243	172	71	29
	Jellico, Tenn.....	8,702	7,948	754	8	480	259	221	46
E	Vincennes, Ind.....	1,863	1,717	146	8	1,311	679	632	48
G	McAlester, Okla.....	662	661	1	0	108	98	10	9
H	Denver, Colo.....	1,206	1,065	141	12	204	107	97	48
	Salt Lake City, Utah	246	189	57	23	243	61	182	75
	Seattle, Wash.....	55	55	0	0	92	82	10	11
	Anchorage, Alaska...	9	9	0	0	12	7	5	42
I	Norton, Va.....	34,260	32,334	1,926	6	3,457	2,778	679	20
	Barbourville, Ky....	17,251	16,283	968	6	2,891	2,145	746	26
	National data...	110,887	103,338	7,549	7	20,501	12,242	8,259	40

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TABLE 2. - Violations of the Federal Mine Safety Codes abated during inspections, 1959, by States

State	Title I underground mines				Title II mines			
	Violations observed	Violations recorded in reports	Violations abated during inspections	Violations abated during inspections, percent	Violations observed	Violations recorded in reports	Violations abated during inspections	Violations abated during inspections, percent
Alabama	5,134	4,998	136	3	243	172	71	29
Alaska	9	9	0	0	12	7	5	42
Arizona	9	7	2	22	0	0	0	0
Arkansas	428	428	0	0	74	69	5	7
Colorado	573	473	100	17	146	65	81	55
Georgia	140	140	0	0	0	0	0	0
Illinois	277	202	75	27	472	220	252	53
Indiana	330	295	35	11	433	242	191	44
Iowa	480	479	1	0	78	75	3	4
Kansas	56	56	0	0	0	0	0	0
Kentucky	28,870	27,050	1,820	6	3,786	2,643	1,143	30
Maryland	523	486	37	7	63	45	18	29
Missouri	307	307	0	0	63	59	4	6
Montana	297	296	1	0	33	30	3	9
New Mexico	239	203	36	15	25	12	13	52
North Dakota	36	36	0	0	0	0	0	0
Ohio	4,440	4,174	266	6	609	308	301	49
Oklahoma	178	177	1	1	34	29	5	15
Oregon	2	2	0	0	0	0	0	0
Pa. (anth.)	7,216	7,046	170	2	917	591	326	36
Pa. (bit.)	11,641	10,729	912	8	2,378	1,218	1,160	49
South Dakota	0	0	0	0	0	0	0	0
Tennessee	8,702	7,948	754	9	480	259	221	46
Texas	0	0	0	0	0	0	0	0
Utah	230	173	57	25	217	55	162	75
Virginia	23,110	22,001	1,109	5	2,827	2,363	464	16
Washington	53	53	0	0	92	82	10	11
West Virginia	17,539	15,504	2,035	12	7,493	3,692	3,801	51
Wyoming	68	66	2	3	26	6	20	77
National data.	110,887	103,338	7,549	7	20,501	12,242	8,259	40

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APPENDIX G

Safety-education training of mine personnel, 1959

State	CMAPC[1] for miners		CMAPC[1] for supervisors	FAP[2] for coal-mine supervisors	Haulage safety course	Roof-control course	Electrical safety course	Safety-lamp training	First-aid training	Mine rescue training
	Initial	Supplemental								
Alabama.....	0	0	0	0	3,315	3,315	0	0	0	0
Alaska.....	0	0	0	0	0	39	0	1	169	0
Arizona.....	0	0	0	0	0	12	0	0	0	0
Arkansas.....	0	0	0	0	0	0	0	0	138	0
Colorado.....	0	0	0	0	0	3,246	0	4	221	37
Georgia.....	0	0	0	0	0	0	0	0	0	0
Illinois.....	0	0	0	0	0	0	0	0	518	1
Indiana.....	0	0	0	0	0	0	0	0	220	0
Iowa.....	0	0	0	0	0	0	0	0	65	0
Kansas.....	0	0	0	0	0	0	0	0	28	0
Kentucky.....	245	315	0	0	2,085	5,890	0	70	688	152
Maryland.....	113	0	0	0	0	509	0	0	347	14
Missouri.....	0	0	0	0	0	0	0	0	36	29
Montana.....	0	0	0	0	0	207	0	0	197	0
New Mexico...	0	0	0	0	0	282	0	0	303	35
North Dakota.	0	0	0	0	0	7	0	0	0	0
Ohio.....	0	0	0	0	0	3,069	0	0	687	0
Oklahoma.....	24	0	6	0	0	0	0	0	39	0
Oregon.....	0	0	0	0	0	0	0	0	0	0
Pa. (anth.)..	121	80	0	0	0	15,959	0	0	447	23
Pa. (bit.)...	2,105	0	0	0	0	756	0	0	2,041	51
South Dakota.	0	0	0	0	0	0	0	0	7	0
Tennessee....	67	0	0	0	3,530	5,403	7	62	3/58	0
Texas.....	0	0	0	0	0	0	0	0	64	0
Utah.....	0	0	0	0	0	0	0	0	0	0
Virginia.....	176	268	0	0	2,982	6,809	81	83	1,277	0
Washington...	0	0	0	0	0	0	0	0	0	0
West Virginia	938	2,070	20	125	0	20,393	0	51	2,723	107
Wyoming.....	0	0	0	0	0	22	0	0	75	0
Total...	3,789	2,733	26	125	11,912	65,918	88	271	10,348	449

1/ Coal-Mine Accident Prevention Course.
2/ Fundamentals of Accident Prevention (new training being developed to replace CMAPC for supervisors).
3/ Includes 14 trained in North Carolina.

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APPENDIX H

Miscellaneous special assignments, 1959

Type of assignment	Wilkes-Barre, Pa.	Pittsburgh, Pa.	Johnstown, Pa.	St. Clairsville, Ohio	Mount Hope, W. Va.	Morgantown, W. Va.	Birmingham, Ala.	Jellico, Tenn.	Vincennes, Ind.	McAlester, Okla.	Denver, Colo.	Salt Lake City, Utah	Seattle, Wash.	Anchorage, Alaska	Norton, Va.	Barbourville, Ky.	Totals
Safety meetings attended	187	308	103	32	25	73	122	18	58	37	48	1	0	0	19	0	1,031
Demonstrations and lectures given	0	16	0	10	178	0	0	0	25	22	9	1	0	0	0	0	261
Escorting foreign visitors to mines and plants	1	59	1	0	1	0	2	0	2	0	4	1	0	0	0	0	71
Research to encourage development of fire-resistant hydraulic fluids	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Surveys of auxiliary ventilation in continuous miner places	0	2	0	0	0	2	0	0	1	0	0	0	0	0	0	0	5
Participating in litigations	2	3	0	0	0	1	0	2	1	0	0	0	0	0	0	0	9
Pillar extraction study	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Inundation hazard and impounded water studies	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4
Investigating auxiliary-fan installations	0	0	0	2	0	0	0	0	1	0	1	1	0	0	0	0	5
Studies of electrical equipment	0	4	1	0	0	0	0	5	18	4	0	0	0	0	0	0	32
Research on degasification of coalbeds	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Testing oxygen breathing apparatus and mine rescue equipment	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Investigating noncoal-mine accidents	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
Safety inspection of noncoal mines and tunnels	0	1	0	0	0	0	0	0	0	0	8	2	0	0	0	0	11
Assisting in foam-plug fire-fighting experiments	0	1	0	0	6	0	0	0	0	0	0	0	0	0	0	0	7
Participating in inspector-training classes	0	0	2	0	0	0	1	0	0	3	0	1	0	0	0	0	7
Studies on storage and preparation of ammonium-nitrate explosives	0	0	0	5	0	0	0	1	0	0	1	0	0	0	0	0	7
Assisting in making safety motion picture	0	0	0	1	0	1	0	3	1	0	0	0	0	0	0	0	6
Investigating outcrop and surface fires	0	0	0	0	0	2	0	0	0	0	7	0	0	0	0	0	9
Participating in State examinations	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	5
Attending coroners' inquests	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	4
Assisting in roof-control research	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Studies of underground storage of gas and/or jet fuel	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
Conference with foreign visitors	0	0	0	4	0	0	0	0	1	0	7	0	0	0	0	0	12
Dust-control studies	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1

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APPENDIX I

TABLE 1. - Number of fatal and nonfatal injuries and rates per million man-hours of exposure, portal to portal, in coal mines, 1932-59

BITUMINOUS

Period[1/]	Fatal	Nonfatal	Man-hours	Rate		Change, percent			
				Fatal	Nonfatal	Fatal	Rate	Nonfatal	Rate
1932-41, inclusive.....	10,036	447,139	6,794,840,163	1.48	65.81				
1942-51, inclusive.....	8,889	416,646	7,496,573,667	1.19	55.58	-11	-20	-7	-16
1952-59, inclusive[2/].....	2,927	130,334	2,944,592,104	.99	44.26				

ANTHRACITE

1932-41, inclusive.....	2,295	151,299	1,428,093,979	1.61	105.94				
1942-51, inclusive.....	1,537	110,234	1,374,622,564	1.12	80.19	-33	-30	-27	-24
1952-59, inclusive[3/].....	470	26,653	419,228,606	1.12	63.58				

ALL COAL

1932-41, inclusive.....	12,331	598,438	8,222,934,142	1.50	72.78				
1942-51, inclusive.....	10,426	526,880	8,871,196,231	1.18	59.39	-15	-21	-12	-18
1952-59, inclusive[4/].....	3,397	156,987	3,363,820,710	1.01	46.67				

1/ Calendar years.
2/ 1958 data subject to revision--1959 preliminary.
3/ 1959 preliminary.
4/ Data for 1958 subject to revision--for 1959 preliminary.

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TABLE 2. - Number of fatal and nonfatal injuries per million man-hours of exposure, portal to portal, in coal mines of the United States, 1932-59

Calendar year	Fatal injuries						Nonfatal injuries					
	Bituminous		Anthracite		Total		Bituminous		Anthracite		Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1932.....	958	1.77	249	1.59	1,207	1.73	39,352	72.58	16,931	107.88	56,283	80.50
1933.....	833	1.31	231	1.49	1,064	1.34	43,946	68.87	15,183	98.13	59,129	74.58
1934.....	958	1.41	268	1.50	1,226	1.43	46,982	69.39	18,577	104.15	65,559	76.63
1935.....	968	1.46	274	1.78	1,242	1.52	47,529	71.47	15,897	103.16	63,426	77.43
1936.....	1,098	1.43	244	1.56	1,342	1.45	50,514	65.62	17,026	108.80	67,540	72.91
1937.....	1,198	1.54	215	1.58	1,413	1.55	52,847	68.05	13,412	98.72	66,259	72.62
1938.....	880	1.52	225	1.94	1,105	1.59	36,794	63.47	12,842	110.85	49,636	71.36
1939.....	867	1.36	211	1.71	1,078	1.42	38,544	60.52	13,229	107.37	51,773	68.12
1940.....	1,204	1.68	184	1.50	1,388	1.65	43,994	61.28	13,782	112.55	57,776	68.75
1941.....	1,072	1.35	194	1.49	1,266	1.37	46,637	58.93	14,420	110.83	61,057	66.26
1942.....	1,245	1.41	226	1.64	1,471	1.44	53,193	60.21	13,581	98.73	66,774	65.40
1943.....	1,225	1.39	226	1.50	1,451	1.40	51,067	57.79	13,527	89.68	64,594	62.44
1944.....	1,124	1.23	174	1.06	1,298	1.20	51,253	56.02	12,438	76.05	63,691	59.06
1945.....	925	1.13	143	1.01	1,068	1.11	46,194	56.52	10,923	77.32	57,117	59.58
1946.....	795	1.09	173	1.14	968	1.10	42,817	58.81	12,533	82.65	55,350	62.93
1947.....	985	1.23	173	1.18	1,158	1.22	46,025	57.32	11,635	79.41	57,660	60.72
1948.....	862	1.15	137	.91	999	1.11	42,078	56.28	11,394	75.69	53,472	59.53
1949.....	494	.93	91	.83	585	.91	27,548	51.67	7,857	71.88	35,405	55.11
1950.....	550	.92	93	.80	643	.90	28,390	47.73	8,874	76.14	37,264	52.38
1951.....	684	1.16	101	.95	785	1.13	28,081	47.56	7,472	69.94	35,553	50.99
1952.....	449	.90	99	1.03	548	.92	23,719	47.64	6,355	66.35	30,074	50.66
1953.....	397	.89	64	.92	461	.90	20,112	45.26	4,146	59.85	24,258	47.23
1954.....	334	.99	62	1.23	396	1.02	14,746	43.66	2,972	59.18	17,718	45.67
1955.....	360	.96	60	1.30	420	1.00	15,966	42.76	2,919	63.46	18,885	45.03
1956.....	392	1.02	56	1.12	448	1.03	16,486	42.99	3,330	66.31	19,816	45.69
1957.....	427	1.17	51	1.15	478	1.17	15,915	43.74	2,877	64.93	18,792	46.04
1958[1]/.....	324	1.16	32	.90	356	1.13	12,230	43.87	2,124	59.88	14,354	45.68
1959[2]/.....	244	.92	46	1.64	290	.99	11,160	42.09	1,930	69.05	13,090	44.66

1/ Data for 1958 bituminous-coal mines are subject to revision.
2/ Fatalities are preliminary and nonfatal injuries are estimates based on a 9-month preliminary figure.

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TABLE 3. - Number of major coal-mine disasters in the United States and number of persons killed, 1932-59

Calendar year	Number of major disasters	Number of persons killed	Calendar year	Number of major disasters	Number of persons killed
1932.....	6	145	1946.....	2	27
1933.....	1	7	1947.....	6	179
1934.....	2	22	1948.....	6	49
1935.....	4	35	1949.....	0	0
1936.....	5	37	1950.....	0	0
1937.....	6	101	1951.....	5	157
1938.....	6	84	1952.....	1/2	11
1939.....	1	28	1953.....	1	5
1940.....	6	276	1954.....	1	16
1941.....	8	73	1955.....	0	0
1942.....	7	132	1956.....	0	0
1943.....	8	174	1957.....	5	64
1944.....	4	94	1958.....	3	42
1945.....	5	68	1959.....	2	21

1/ Both occurred before effective date of Federal Coal-Mine Safety Act.

TABLE 4. - Underground fatalities in the coal-mining industry, Title I and Title II mines, 1953-59

	1953	1954	1955	1956	1957	1958 2/	1959 3/
Bituminous:							
Title I mines:							
Fatalities.....	69	57	59	72	92	83	70
Rate 1/.....	2.79	2.25	1.87	2.14	2.51	2.99	2.65
Title II mines:							
Fatalities.....	280	234	244	270	283	204	139
Rate 1/.....	.92	1.08	1.04	1.14	1.29	1.21	.86
Total.....	349	291	303	342	375	287	209
Rate 1/.....	1.06	1.20	1.13	1.26	1.46	1.46	1.12
Anthracite:							
Title I mines:							
Fatalities.....	12	15	10	15	12	7	7
Rate 1/.....	7.08	11.48	2.02	3.24	2.71	1.67	2.12
Title II mines:							
Fatalities.....	48	36	39	33	37	19	34
Rate 1/.....	1.21	1.31	1.77	1.43	1.90	1.40	3.19
Total.....	60	51	49	48	49	26	41
Rate 1/.....	1.45	1.77	1.82	1.73	2.05	1.47	2.93
All coal:							
Title I mines:							
Fatalities.....	81	72	69	87	104	90	77
Rate 1/.....	3.06	2.70	1.89	2.28	2.53	2.82	2.59
Title II mines:							
Fatalities.....	328	270	283	303	320	223	173
Rate 1/.....	.96	1.11	1.10	1.16	1.34	1.22	1.01
Total.....	409	342	352	390	424	313	250
Rate 1/.....	1.11	1.26	1.20	1.30	1.51	1.46	1.24

1/ Per million man-hours.
2/ Data for 1958 bituminous-coal mines subject to revision.
3/ All data are preliminary.

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TABLE 5. - Production of coal in the United States in 1958, by States, thousand net tons

Bituminous coal and lignite[1/]		Bituminous coal and lignite[1/]	
Alabama	11,182	New Mexico	117
Alaska	759	North Dakota (lignite)	2,314
Arkansas	364	Ohio	32,028
Colorado	2,974	Oklahoma	1,630
Illinois	43,912	Pennsylvania	67,771
Indiana	15,022	South Dakota (lignite)	20
Iowa	1,179	Tennessee	6,785
Kansas	823	Utah	5,328
Kentucky:		Virginia	26,826
Eastern	38,231	Washington	252
Western	28,081	West Virginia	119,468
Total Kentucky	66,312	Wyoming	1,629
Maryland	838	Other States[2/]	16
Missouri	2,592	Total, bituminous coal and lignite	410,446
Montana:		Anthracite[3/]	
Bituminous	211	Pennsylvania	21,171
Lignite	94	Grand total	431,617
Total Montana	305		

1/ Published in Bureau of Mines Mineral Market Summary No. 2974.
2/ Includes Arizona and Georgia.
3/ Provided by Bureau of Mines Division of Anthracite.

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